

#24

# Acknowledgment Receipt:

SUBMISSION TYPE: **BIO Sequence Filing**  
APPLICATION NUMBER: **10055797**  
FIRST NAMED INVENTOR: **David Beach**  
TITLE OF INVENTION: **Methods and Compositions for RNA Interference**  
ATTORNEY DOCKET NUMBER: **GNCA-P03-007**



## FILE LISTING:

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|------------------------------|--|
| transmittal                  | tranGNCA-P03-007SequenceListing.xml 6333 Bytes |
| sequence-listing             | GNCA-P03-007SequenceListing.txt 108585 Bytes   |
| biotechnology-listing-filing | GNCA-P03-007SequenceListingbio.xml 957 Bytes   |
| biotechnology-listing-filing | u-bio.dtd 3619 Bytes                           |
| biotechnology-listing-filing | e-bioseq.xml 6067 Bytes                        |

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DIGITAL CERTIFICATE HOLDER NAME: **cn=Matthew P. Vincent, ou=Registered Attorneys**

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## SEQUENCE LISTING

&lt;110&gt; Hammond et al.

&lt;120&gt; METHODS AND COMPOSITIONS FOR RNA INTERFERENCE

&lt;130&gt; GNCA-P03-007

&lt;140&gt; 10/055,797

&lt;141&gt; 2002-01-22

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&lt;160&gt; 17

&lt;170&gt; PatentIn version 3.1

&lt;210&gt; 1

&lt;211&gt; 5775

&lt;212&gt; DNA

&lt;213&gt; Homo sapiens

&lt;220&gt;

&lt;221&gt; CDS

&lt;222&gt; (1)..(5775)

&lt;223&gt;

&lt;400&gt; 1

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| atg | aaa | agc | cct | gct | ttg | caa | ccc | ctc | agc | atg | gca | ggc | ctg | cag | ctc | 48  |
| Met | Lys | Ser | Pro | Ala | Leu | Gln | Pro | Leu | Ser | Met | Ala | Gly | Leu | Gln | Leu |     |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |     |
| atg | acc | cct | gct | tcc | tca | cca | atg | ggt | cct | ttc | ttt | gga | ctg | cca | tg  | 96  |
| Met | Thr | Pro | Ala | Ser | Ser | Pro | Met | Gly | Pro | Phe | Phe | Gly | Leu | Pro | Trp |     |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |     |
| caa | caa | gaa | gca | att | cat | gat | aac | att | tat | acg | cca | aga | aaa | tat | cag | 144 |
| Gln | Gln | Glu | Ala | Ile | His | Asp | Asn | Ile | Tyr | Thr | Pro | Arg | Lys | Tyr | Gln |     |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |     |
| gtt | gaa | ctg | ctt | gaa | gca | gct | ctg | gat | cat | aat | acc | atc | gtc | tgt | tta | 192 |
| Val | Glu | Leu | Leu | Glu | Ala | Ala | Leu | Asp | His | Asn | Thr | Ile | Val | Cys | Leu |     |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |     |
| aac | act | ggc | tca | ggg | aag | aca | ttt | att | gct | agt | act | act | cta | cta | aag | 240 |
| Asn | Thr | Gly | Ser | Gly | Lys | Thr | Phe | Ile | Ala | Ser | Thr | Thr | Leu | Leu | Lys |     |
| 65  |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |     |     |
| agc | tgt | ctc | tat | cta | gat | cta | ggg | gag | act | tca | gct | aga | aat | gga | aaa | 288 |
| Ser | Cys | Leu | Tyr | Leu | Asp | Leu | Gly | Glu | Thr | Ser | Ala | Arg | Asn | Gly | Lys |     |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |     |
| agg | acg | gtg | ttc | ttg | gtc | aac | tct | gca | aac | cag | gtt | gct | caa | caa | gtg | 336 |
| Arg | Thr | Val | Phe | Leu | Val | Asn | Ser | Ala | Asn | Gln | Val | Ala | Gln | Gln | Val |     |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |     |
| tca | gct | gtc | aga | act | cat | tca | gat | ctc | aag | gtt | ggg | gaa | tac | tca | aac | 384 |
| Ser | Ala | Val | Arg | Thr | His | Ser | Asp | Leu | Lys | Val | Gly | Glu | Tyr | Ser | Asn |     |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |     |
| cta | gaa | gta | aat | gca | tct | tg  | aca | aaa | gag | aga | tg  | aac | caa | gag | ttt | 432 |
| Leu | Glu | Val | Asn | Ala | Ser | Trp | Thr | Lys | Glu | Arg | Trp | Asn | Gln | Glu | Phe |     |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |     |
| act | aag | cac | cag | gtt | ctc | att | atg | act | tgc | tat | gtc | gcc | ttg | aat | gtt | 480 |
| Thr | Lys | His | Gln | Val | Leu | Ile | Met | Thr | Cys | Tyr | Val | Ala | Leu | Asn | Val |     |
|     | 145 |     |     |     | 150 |     |     |     | 155 |     |     |     |     |     | 160 |     |
| ttg | aaa | aat | ggt | tac | tta | tca | ctg | tca | gac | att | aac | ctt | ttg | gtg | ttt | 528 |
| Leu | Lys | Asn | Gly | Tyr | Leu | Ser | Leu | Ser | Asp | Ile | Asn | Leu | Leu | Val | Phe |     |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     | 175 |     |     |     |
| gat | gag | tgt | cat | ctt | gca | atc | cta | gac | cac | ccc | tat | cga | gaa | ttt | atg | 576 |

## GNCA-P03-007SequenceListing.txt

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Asp | Glu | Cys | His | Leu | Ala | Ile | Leu | Asp | His | Pro | Tyr | Arg | Glu | Phe | Met |      |
| aag | ctc | tgt | gaa | att | tgt | cca | tca | tgt | cct | cg  | att | ttg | gga | cta | act | 624  |
| Lys | Leu | Cys | Glu | Ile | Cys | Pro | Ser | Cys | Pro | Arg | Ile | Leu | Gly | Leu | Thr |      |
|     |     | 195 |     |     |     | 200 |     |     |     |     |     | 205 |     |     |     |      |
| gct | tcc | att | tta | aat | ggg | aaa | tgg | gat | cca | gag | gat | ttg | gaa | gaa | aag | 672  |
| Ala | Ser | Ile | Leu | Asn | Gly | Lys | Trp | Asp | Pro | Glu | Asp | Leu | Glu | Glu | Lys |      |
|     |     | 210 |     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |      |
| ttt | cag | aaa | cta | gag | aaa | att | ctt | aag | agt | aat | gct | gaa | act | gca | act | 720  |
| Phe | Gln | Lys | Leu | Glu | Lys | Ile | Leu | Lys | Ser | Asn | Ala | Glu | Thr | Ala | Thr |      |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |      |
| gac | ctg | gtg | gtc | tta | gac | agg | tat | act | tct | cag | cca | tgt | gag | att | gtg | 768  |
| Asp | Leu | Val | Val | Leu | Asp | Arg | Tyr | Thr | Ser | Gln | Pro | Cys | Glu | Ile | Val |      |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |      |
| gtg | gat | tgt | gga | cca | ttt | act | gac | aga | agt | ggg | ctt | tat | gaa | aga | ctg | 816  |
| Val | Asp | Cys | Gly | Pro | Phe | Thr | Asp | Arg | Ser | Gly | Leu | Tyr | Glu | Arg | Leu |      |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |      |
| ctg | atg | gaa | tta | gaa | gaa | gca | ctt | aat | ttt | atc | aat | gat | tgt | aat | ata | 864  |
| Leu | Met | Glu | Leu | Glu | Glu | Ala | Leu | Asn | Phe | Ile | Asn | Asp | Cys | Asn | Ile |      |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |      |
| tct | gta | cat | tca | aaa | gaa | aga | gat | tct | act | tta | att | tcg | aaa | cag | ata | 912  |
| Ser | Val | His | Ser | Lys | Glu | Arg | Asp | Ser | Thr | Leu | Ile | Ser | Lys | Gln | Ile |      |
|     |     | 290 |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |      |
| cta | tca | gac | tgt | cgt | gcc | gta | ttg | gta | gtt | ctg | gga | ccc | tgg | tgt | gca | 960  |
| Leu | Ser | Asp | Cys | Arg | Ala | Val | Leu | Val | Val | Leu | Gly | Pro | Trp | Cys | Ala |      |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |      |
| gat | aaa | gta | gct | gga | atg | atg | gta | aga | gaa | cta | cag | aaa | tac | atc | aaa | 1008 |
| Asp | Lys | Val | Ala | Gly | Met | Met | Val | Arg | Glu | Leu | Gln | Lys | Tyr | Ile | Lys |      |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |      |
| cat | gag | caa | gag | gag | ctg | cac | agg | aaa | ttt | tta | ttg | ttt | aca | gac | act | 1056 |
| His | Glu | Gln | Glu | Glu | Leu | His | Arg | Lys | Phe | Leu | Leu | Phe | Thr | Asp | Thr |      |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |      |
| ttc | cta | agg | aaa | ata | cat | gca | cta | tgt | gaa | gag | cac | ttc | tca | cct | gcc | 1104 |
| Phe | Leu | Arg | Lys | Ile | His | Ala | Leu | Cys | Glu | Glu | His | Phe | Ser | Pro | Ala |      |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |      |
| tca | ctt | gac | ctg | aaa | ttt | gta | act | cct | aaa | gta | atc | aaa | ctg | ctc | gaa | 1152 |
| Ser | Leu | Asp | Leu | Lys | Phe | Val | Thr | Pro | Lys | Val | Ile | Lys | Leu | Leu | Glu |      |
|     |     | 370 |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |      |
| atc | tta | cg  | aaa | tat | aaa | cca | tat | gag | cga | cac | agt | ttt | gaa | agc | gtt | 1200 |
| Ile | Leu | Arg | Lys | Tyr | Lys | Pro | Tyr | Glu | Arg | His | Ser | Phe | Glu | Ser | Val |      |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |      |
| gag | tgg | tat | aat | aat | aga | aat | cag | gat | aat | tat | gtg | tca | tgg | agt | gat | 1248 |
| Glu | Trp | Tyr | Asn | Asn | Arg | Asn | Gln | Asp | Asn | Tyr | Val | Ser | Trp | Ser | Asp |      |
|     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |     |      |
| tct | gag | gat | gat | gat | gag | gat | gaa | gaa | att | gaa | gaa | aaa | gag | aag | cca | 1296 |
| Ser | Glu | Asp | Asp | Asp | Glu | Asp | Glu | Glu | Ile | Glu | Glu | Lys | Glu | Lys | Pro |      |
|     |     |     | 420 |     |     |     | 425 |     |     |     |     |     | 430 |     |     |      |
| gag | aca | aat | ttt | cct | tct | cct | ttt | acc | aac | att | ttg | tgc | gga | att | att | 1344 |
| Glu | Thr | Asn | Phe | Pro | Ser | Pro | Phe | Thr | Asn | Ile | Leu | Cys | Gly | Ile | Ile |      |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |      |
| ttt | gtg | gaa | aga | aga | tac | aca | gca | gtt | gtc | tta | aac | aga | ttg | ata | aag | 1392 |
| Phe | Val | Glu | Arg | Arg | Tyr | Thr | Ala | Val | Val | Leu | Asn | Arg | Leu | Ile | Lys |      |
|     |     | 450 |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |      |
| gaa | gct | ggc | aaa | caa | gat | cca | gag | ctg | gct | tat | atc | agt | agc | aat | ttc | 1440 |
| Glu | Ala | Gly | Lys | Gln | Asp | Pro | Glu | Leu | Ala | Tyr | Ile | Ser | Ser | Asn | Phe |      |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |      |
| ata | act | gga | cat | ggc | att | ggg | aag | aat | cag | cct | cg  | aac | aac | acg | atg | 1488 |
| Ile | Thr | Gly | His | Gly | Ile | Gly | Lys | Asn | Gln | Pro | Arg | Asn | Asn | Thr | Met |      |
|     |     |     | 485 |     |     |     |     |     | 490 |     |     |     |     | 495 |     |      |
| gaa | gca | gaa | ttc | aga | aaa | cag | gaa | gag | gta | ctt | agg | aaa | ttt | cga | gca | 1536 |
| Glu | Ala | Glu | Phe | Arg | Lys | Gln | Glu | Glu | Val | Leu | Arg | Lys | Phe | Arg | Ala |      |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     |     | 510 |     |     |      |
| cat | gag | acc | aac | ctg | ctt | att | gca | aca | agt | att | gta | gaa | gag | ggg | gtt | 1584 |

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| His | Glu | Thr | Asn | Leu | Leu | Ile | Ala | Thr | Ser | Ile | Val | Glu | Glu | Gly | Val |      |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| gat | ata | 515 | cca | aaa | tgc | aac | ttg | gtg | cgt | ttt | gat | ttg | ccc | aca | gaa | 1632 |
| Asp | Ile | Pro | Lys | Cys | Asn | Leu | Val | Val | Arg | Phe | Asp | Leu | Pro | Thr | Glu |      |
| 530 |     |     |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |      |
| tat | cga | tcc | tat | gtt | caa | tct | aaa | gga | aga | gca | agg | gca | ccc | atc | tct | 1680 |
| Tyr | Arg | Ser | Tyr | Val | Gln | Ser | Lys | Gly | Arg | Ala | Arg | Ala | Pro | Ile | Ser |      |
| 545 |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |      |
| aat | tat | ata | atg | tta | gcg | gat | aca | gac | aaa | ata | aaa | agt | ttt | gaa | gaa | 1728 |
| Asn | Tyr | Ile | Met | Leu | Ala | Asp | Thr | Asp | Lys | Ile | Lys | Ser | Phe | Glu | Glu |      |
|     |     |     |     | 565 |     |     |     |     | 570 |     |     |     |     | 575 |     |      |
| gac | ctt | aaa | acc | tac | aaa | gct | att | gaa | aag | atc | ttg | aga | aac | aag | tgt | 1776 |
| Asp | Leu | Lys | Thr | Tyr | Lys | Ala | Ile | Glu | Lys | Ile | Leu | Arg | Asn | Lys | Cys |      |
|     |     |     | 580 |     |     |     |     | 585 |     |     |     |     | 590 |     |     |      |
| tcc | aag | tcg | gtt | gat | act | ggt | gag | act | gac | att | gat | cct | gtc | atg | gat | 1824 |
| Ser | Lys | Ser | Val | Asp | Thr | Gly | Glu | Thr | Asp | Ile | Asp | Pro | Val | Met | Asp |      |
|     |     |     | 595 |     |     |     | 600 |     |     |     |     | 605 |     |     |     |      |
| gat | gat | cac | gtt | ttc | cca | cca | tat | gtg | ttg | agg | cct | gac | gat | ggt | ggt | 1872 |
| Asp | Asp | His | Val | Phe | Pro | Pro | Tyr | Val | Leu | Arg | Pro | Asp | Asp | Gly | Gly |      |
|     |     |     | 610 |     |     | 615 |     |     |     |     | 620 |     |     |     |     |      |
| cca | cga | gtc | aca | atc | aac | acg | gcc | att | gga | cac | atc | aat | aga | tac | tgt | 1920 |
| Pro | Arg | Val | Thr | Ile | Asn | Thr | Ala | Ile | Gly | His | Ile | Asn | Arg | Tyr | Cys |      |
| 625 |     |     |     |     | 630 |     |     |     | 635 |     |     |     |     |     | 640 |      |
| gct | aga | tta | cca | agt | gat | ccg | ttt | act | cat | cta | gct | cct | aaa | tgc | aga | 1968 |
| Ala | Arg | Leu | Pro | Ser | Asp | Pro | Phe | Thr | His | Leu | Ala | Pro | Lys | Cys | Arg |      |
|     |     |     |     | 645 |     |     |     |     | 650 |     |     |     |     | 655 |     |      |
| acc | cga | gag | ttg | cct | gat | ggt | aca | ttt | tat | tca | act | ctt | tat | ctg | cca | 2016 |
| Thr | Arg | Glu | Leu | Pro | Asp | Gly | Thr | Phe | Tyr | Ser | Thr | Leu | Tyr | Leu | Pro |      |
|     |     |     | 660 |     |     |     |     | 665 |     |     |     |     | 670 |     |     |      |
| att | aac | tca | cct | ctt | cga | gcc | tcc | att | gtt | ggt | cca | cca | atg | agc | tgt | 2064 |
| Ile | Asn | Ser | Pro | Leu | Arg | Ala | Ser | Ile | Val | Gly | Pro | Pro | Met | Ser | Cys |      |
|     |     |     | 675 |     |     |     | 680 |     |     |     |     | 685 |     |     |     |      |
| gta | cga | ttg | gct | gaa | aga | gtt | gtc | gct | ctc | att | tgc | tgt | gag | aaa | ctg | 2112 |
| Val | Arg | Leu | Ala | Glu | Arg | Val | Val | Ala | Leu | Ile | Cys | Cys | Glu | Lys | Leu |      |
|     |     |     |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     |      |
| cac | aaa | att | ggc | gaa | ctg | gat | gac | cat | ttg | atg | cca | gtt | ggg | aaa | gag | 2160 |
| His | Lys | Ile | Gly | Glu | Leu | Asp | Asp | His | Leu | Met | Pro | Val | Gly | Lys | Glu |      |
| 705 |     |     |     |     | 710 |     |     |     | 715 |     |     |     |     |     | 720 |      |
| act | gtt | aaa | tat | gaa | gag | gag | ctt | gat | ttg | cat | gat | gaa | gaa | gag | acc | 2208 |
| Thr | Val | Lys | Tyr | Glu | Glu | Glu | Leu | Asp | Leu | His | Asp | Glu | Glu | Glu | Thr |      |
|     |     |     |     | 725 |     |     |     |     | 730 |     |     |     |     | 735 |     |      |
| agt | gtt | cca | gga | aga | cca | ggt | tcc | acg | aaa | cga | agg | cag | tgc | tac | cca | 2256 |
| Ser | Val | Pro | Gly | Arg | Pro | Gly | Ser | Thr | Lys | Arg | Arg | Gln | Cys | Tyr | Pro |      |
|     |     |     | 740 |     |     |     | 745 |     |     |     |     |     | 750 |     |     |      |
| aaa | gca | att | cca | gag | tgt | ttg | agg | gat | agt | tat | ccc | aga | cct | gat | cag | 2304 |
| Lys | Ala | Ile | Pro | Glu | Cys | Leu | Arg | Asp | Ser | Tyr | Pro | Arg | Pro | Asp | Gln |      |
|     |     |     | 755 |     |     |     | 760 |     |     |     |     | 765 |     |     |     |      |
| ccc | tgt | tac | ctg | tat | gtg | ata | gga | atg | gtt | tta | act | aca | cct | tta | cct | 2352 |
| Pro | Cys | Tyr | Leu | Tyr | Val | Ile | Gly | Met | Val | Leu | Thr | Thr | Pro | Leu | Pro |      |
|     |     |     |     |     | 775 |     |     |     |     |     | 780 |     |     |     |     |      |
| gat | gaa | ctc | aac | ttt | aga | agg | cgg | aag | ctc | tat | cct | cct | gaa | gat | acc | 2400 |
| Asp | Glu | Leu | Asn | Phe | Arg | Arg | Arg | Lys | Leu | Tyr | Pro | Pro | Glu | Asp | Thr |      |
| 785 |     |     |     |     | 790 |     |     |     |     | 795 |     |     |     |     | 800 |      |
| aca | aga | tgc | ttt | gga | ata | ctg | acg | gcc | aaa | ccc | ata | cct | cag | att | cca | 2448 |
| Thr | Arg | Cys | Phe | Gly | Ile | Leu | Thr | Ala | Lys | Pro | Ile | Pro | Gln | Ile | Pro |      |
|     |     |     |     | 805 |     |     |     |     | 810 |     |     |     |     | 815 |     |      |
| cac | ttt | cct | gtg | tac | aca | cg  | tct | gga | gag | gtt | acc | ata | tcc | att | gag | 2496 |
| His | Phe | Pro | Val | Tyr | Thr | Arg | Ser | Gly | Glu | Val | Thr | Ile | Ser | Ile | Glu |      |
|     |     |     | 820 |     |     |     |     | 825 |     |     |     |     | 830 |     |     |      |
| ttg | aag | aag | tct | ggt | ttc | atg | ttg | tct | cta | caa | atg | ctt | gag | ttg | att | 2544 |
| Leu | Lys | Lys | Ser | Gly | Phe | Met | Leu | Ser | Leu | Gln | Met | Leu | Glu | Leu | Ile |      |
|     |     |     | 835 |     |     |     | 840 |     |     |     |     | 845 |     |     |     |      |
| aca | aga | ctt | cac | cag | tat | ata | ttc | tca | cat | att | ctt | cgg | ctt | gaa | aaa | 2592 |

## GNCA-P03-007SequenceListing.txt

|     |      |     |     |     |     |      |     |     |     |     |      |      |     |     |     |      |
|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|------|-----|-----|-----|------|
| Thr | Arg  | Leu | His | Gln | Tyr | Ile  | Phe | Ser | His | Ile | Leu  | Arg  | Leu | Glu | Lys |      |
| 850 |      |     |     |     |     | 855  |     |     |     |     | 860  |      |     |     |     |      |
| cct | gca  | cta | gaa | ttt | aaa | cct  | aca | gac | gct | gat | tca  | gca  | tac | tgt | gtt | 2640 |
| Pro | Ala  | Leu | Glu | Phe | Lys | Pro  | Thr | Asp | Ala | Asp | Ser  | Ala  | Tyr | Cys | Val |      |
| 865 |      |     |     |     | 870 |      |     |     |     | 875 |      |      |     |     | 880 |      |
| cta | cct  | ctt | aat | gtt | gtt | aat  | gac | tcc | agc | act | ttg  | gat  | att | gac | ttt | 2688 |
| Leu | Pro  | Leu | Asn | Val | Val | Asn  | Asp | Ser | Ser | Thr | Leu  | Asp  | Ile | Asp | Phe |      |
|     |      |     |     | 885 |     |      |     |     | 890 |     |      |      |     | 895 |     |      |
| aaa | ttc  | atg | gaa | gat | att | gag  | aag | tct | gaa | gct | cgc  | ata  | ggc | att | ccc | 2736 |
| Lys | Phe  | Met | Glu | Asp | Ile | Glu  | Lys | Ser | Glu | Ala | Arg  | Ile  | Gly | Ile | Pro |      |
|     |      |     | 900 |     |     |      |     | 905 |     |     |      | 910  |     |     |     |      |
| agt | aca  | aag | tat | aca | aaa | gaa  | aca | ccc | ttt | gtt | ttt  | aaa  | tta | gaa | gat | 2784 |
| Ser | Thr  | Lys | Tyr | Thr | Lys | Glu  | Thr | Pro | Phe | Val | Phe  | Lys  | Leu | Glu | Asp |      |
|     |      | 915 |     |     |     |      | 920 |     |     |     |      | 925  |     |     |     |      |
| tac | caa  | gat | gcc | gtt | atc | att  | cca | aga | tat | cgc | aat  | ttt  | gat | cag | cct | 2832 |
| Tyr | Gln  | Asp | Ala | Val | Ile | Ile  | Pro | Arg | Tyr | Arg | Asn  | Phe  | Asp | Gln | Pro |      |
|     | 930  |     |     |     | 935 |      |     |     |     |     | 940  |      |     |     |     |      |
| cat | cga  | ttt | tat | gta | gct | gat  | gtg | tac | act | gat | ctt  | acc  | cca | ctc | agt | 2880 |
| His | Arg  | Phe | Tyr | Val | Ala | Asp  | Val | Tyr | Thr | Asp | Leu  | Thr  | Pro | Leu | Ser |      |
| 945 |      |     |     | 950 |     |      |     |     |     | 955 |      |      |     |     | 960 |      |
| aaa | ttt  | cct | tcc | cct | gag | tat  | gaa | act | ttt | gca | gaa  | tat  | tat | aaa | aca | 2928 |
| Lys | Phe  | Pro | Ser | Pro | Glu | Tyr  | Glu | Thr | Phe | Ala | Glu  | Tyr  | Tyr | Lys | Thr |      |
|     |      |     |     | 965 |     |      |     |     | 970 |     |      |      |     | 975 |     |      |
| aag | tac  | aac | ctt | gac | cta | acc  | aat | ctc | aac | cag | cca  | ctg  | ctg | gat | gtg | 2976 |
| Lys | Tyr  | Asn | Leu | Asp | Leu | Thr  | Asn | Leu | Asn | Gln | Pro  | Leu  | Leu | Asp | Val |      |
|     |      |     | 980 |     |     |      |     | 985 |     |     |      |      | 990 |     |     |      |
| gac | cac  | aca | tct | tca | aga | ctt  | aat | ctt | ttg | aca | cct  | cga  | cat | ttg | aat | 3024 |
| Asp | His  | Thr | Ser | Ser | Arg | Leu  | Asn | Leu | Leu | Thr | Pro  | Arg  | His | Leu | Asn |      |
|     |      | 995 |     |     |     | 1000 |     |     |     |     |      | 1005 |     |     |     |      |
| cag | aag  | ggg | aaa | gcg | ctt | cct  | tta | agc | agt | gct | gag  | aag  | agg | aaa |     | 3069 |
| Gln | Lys  | Gly | Lys | Ala | Leu | Pro  | Leu | Ser | Ser | Ala | Glu  | Lys  | Arg | Lys |     |      |
|     | 1010 |     |     |     |     | 1015 |     |     |     |     | 1020 |      |     |     |     |      |
| gcc | aaa  | tgg | gaa | agt | ctg | cag  | aat | aaa | cag | ata | ctg  | gtt  | cca | gaa |     | 3114 |
| Ala | Lys  | Trp | Glu | Ser | Leu | Gln  | Asn | Lys | Gln | Ile | Leu  | Val  | Pro | Glu |     |      |
|     | 1025 |     |     |     |     | 1030 |     |     |     |     | 1035 |      |     |     |     |      |
| ctc | tgt  | gct | ata | cat | cca | att  | cca | gca | tca | ctg | tgg  | aga  | aaa | gct |     | 3159 |
| Leu | Cys  | Ala | Ile | His | Pro | Ile  | Pro | Ala | Ser | Leu | Trp  | Arg  | Lys | Ala |     |      |
|     | 1040 |     |     |     |     | 1045 |     |     |     |     | 1050 |      |     |     |     |      |
| gtt | tgt  | ctc | ccc | agc | ata | ctt  | tat | cgc | ctt | cac | tgc  | ctt  | ttg | act |     | 3204 |
| Val | Cys  | Leu | Pro | Ser | Ile | Leu  | Tyr | Arg | Leu | His | Cys  | Leu  | Leu | Thr |     |      |
|     | 1055 |     |     |     |     | 1060 |     |     |     |     | 1065 |      |     |     |     |      |
| gca | gag  | gag | cta | aga | gcc | cag  | act | gcc | agc | gat | gct  | ggc  | gtg | gga |     | 3249 |
| Ala | Glu  | Glu | Leu | Arg | Ala | Gln  | Thr | Ala | Ser | Asp | Ala  | Gly  | Val | Gly |     |      |
|     | 1070 |     |     |     |     | 1075 |     |     |     |     | 1080 |      |     |     |     |      |
| gtc | aga  | tca | ctt | cct | gcg | gat  | ttt | aga | tac | cct | aac  | tta  | gac | ttc |     | 3294 |
| Val | Arg  | Ser | Leu | Pro | Ala | Asp  | Phe | Arg | Tyr | Pro | Asn  | Leu  | Asp | Phe |     |      |
|     | 1085 |     |     |     |     | 1090 |     |     |     |     | 1095 |      |     |     |     |      |
| ggg | tgg  | aaa | aaa | tct | att | gac  | agc | aaa | tct | ttc | atc  | tca  | att | tct |     | 3339 |
| Gly | Trp  | Lys | Lys | Ser | Ile | Asp  | Ser | Lys | Ser | Phe | Ile  | Ser  | Ile | Ser |     |      |
|     | 1100 |     |     |     |     | 1105 |     |     |     |     | 1110 |      |     |     |     |      |
| aac | tcc  | tct | tca | gct | gaa | aat  | gat | aat | tac | tgt | aag  | cac  | agc | aca |     | 3384 |
| Asn | Ser  | Ser | Ser | Ala | Glu | Asn  | Asp | Asn | Tyr | Cys | Lys  | His  | Ser | Thr |     |      |
|     | 1115 |     |     |     |     | 1120 |     |     |     |     | 1125 |      |     |     |     |      |
| att | gtc  | cct | gaa | aat | gct | gca  | cat | caa | ggc | gct | aat  | aga  | acc | tcc |     | 3429 |
| Ile | Val  | Pro | Glu | Asn | Ala | Ala  | His | Gln | Gly | Ala | Asn  | Arg  | Thr | Ser |     |      |
|     | 1130 |     |     |     |     | 1135 |     |     |     |     | 1140 |      |     |     |     |      |
| tct | cta  | gaa | aat | cat | gac | caa  | atg | tct | gtg | aac | tgc  | aga  | acg | ttg |     | 3474 |
| Ser | Leu  | Glu | Asn | His | Asp | Gln  | Met | Ser | Val | Asn | Cys  | Arg  | Thr | Leu |     |      |
|     | 1145 |     |     |     |     | 1150 |     |     |     |     | 1155 |      |     |     |     |      |
| ctc | agc  | gag | tcc | cct | ggt | aag  | ctc | cac | gtt | gaa | gtt  | tca  | gca | gat |     | 3519 |
| Leu | Ser  | Glu | Ser | Pro | Gly | Lys  | Leu | His | Val | Glu | Val  | Ser  | Ala | Asp |     |      |
|     | 1160 |     |     |     |     | 1165 |     |     |     |     | 1170 |      |     |     |     |      |
| ctt | aca  | gca | att | aat | ggt | ctt  | tct | tac | aat | caa | aat  | ctc  | gcc | aat |     | 3564 |

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|      |      |     |     |     |     |      |     |     |     |     |      |     |     |     |      |
|------|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|------|
| Leu  | Thr  | Ala | Ile | Asn | Gly | Leu  | Ser | Tyr | Asn | Gln | Asn  | Leu | Ala | Asn |      |
| 1175 | 1175 |     |     |     |     | 1180 |     |     |     |     | 1185 |     |     |     |      |
| ggc  | agt  | tat | gat | tta | gct | aac  | aga | gac | ttt | tcg | caa  | gga | aat | cag | 3609 |
| Gly  | Ser  | Tyr | Asp | Leu | Ala | Asn  | Arg | Asp | Phe | Cys | Gln  | Gly | Asn | Gln |      |
| 1190 | 1190 |     |     |     |     | 1195 |     |     |     |     | 1200 |     |     |     |      |
| cta  | aat  | tac | tac | aag | cag | gaa  | ata | ccc | gtg | caa | cca  | act | acc | tca | 3654 |
| Leu  | Asn  | Tyr | Tyr | Lys | Gln | Glu  | Ile | Pro | Val | Gln | Pro  | Thr | Thr | Ser |      |
| 1205 | 1205 |     |     |     |     | 1210 |     |     |     |     | 1215 |     |     |     |      |
| tat  | tcc  | att | cag | aat | tta | tac  | agt | tac | gag | aac | cag  | ccc | cag | ccc | 3699 |
| Tyr  | Ser  | Ile | Gln | Asn | Leu | Tyr  | Ser | Tyr | Glu | Asn | Gln  | Pro | Gln | Pro |      |
| 1220 | 1220 |     |     |     |     | 1225 |     |     |     |     | 1230 |     |     |     |      |
| agc  | gat  | gaa | tgt | act | ctc | ctg  | agt | aat | aaa | tac | ctt  | gat | gga | aat | 3744 |
| Ser  | Asp  | Glu | Cys | Thr | Leu | Leu  | Ser | Asn | Lys | Tyr | Leu  | Asp | Gly | Asn |      |
| 1235 | 1235 |     |     |     |     | 1240 |     |     |     |     | 1245 |     |     |     |      |
| gct  | aac  | aaa | tct | acc | tca | gat  | gga | agt | cct | gtg | atg  | gcc | gta | atg | 3789 |
| Ala  | Asn  | Lys | Ser | Thr | Ser | Asp  | Gly | Ser | Pro | Val | Met  | Ala | Val | Met |      |
| 1250 | 1250 |     |     |     |     | 1255 |     |     |     |     | 1260 |     |     |     |      |
| cct  | ggg  | acg | aca | gac | act | att  | caa | gtg | ctc | aag | ggc  | agg | atg | gat | 3834 |
| Pro  | Gly  | Thr | Thr | Asp | Thr | Ile  | Gln | Val | Leu | Lys | Gly  | Arg | Met | Asp |      |
| 1265 | 1265 |     |     |     |     | 1270 |     |     |     |     | 1275 |     |     |     |      |
| tct  | gag  | cag | agc | cct | tct | att  | ggg | tac | tcc | tca | agg  | act | ctt | ggc | 3879 |
| Ser  | Glu  | Gln | Ser | Pro | Ser | Ile  | Gly | Tyr | Ser | Ser | Arg  | Thr | Leu | Gly |      |
| 1280 | 1280 |     |     |     |     | 1285 |     |     |     |     | 1290 |     |     |     |      |
| ccc  | aat  | cct | gga | ctt | att | ctt  | cag | gct | ttg | act | ctg  | tca | aac | gct | 3924 |
| Pro  | Asn  | Pro | Gly | Leu | Ile | Leu  | Gln | Ala | Leu | Thr | Leu  | Ser | Asn | Ala |      |
| 1295 | 1295 |     |     |     |     | 1300 |     |     |     |     | 1305 |     |     |     |      |
| agt  | gat  | gga | ttt | aac | ctg | gag  | cgg | ctt | gaa | atg | ctt  | ggc | gac | tcc | 3969 |
| Ser  | Asp  | Gly | Phe | Asn | Leu | Glu  | Arg | Leu | Glu | Met | Leu  | Gly | Asp | Ser |      |
| 1310 | 1310 |     |     |     |     | 1315 |     |     |     |     | 1320 |     |     |     |      |
| ttt  | tta  | aag | cat | gcc | atc | acc  | aca | tat | cta | ttt | tgc  | act | tac | cct | 4014 |
| Phe  | Leu  | Lys | His | Ala | Ile | Thr  | Thr | Tyr | Leu | Phe | Cys  | Thr | Tyr | Pro |      |
| 1325 | 1325 |     |     |     |     | 1330 |     |     |     |     | 1335 |     |     |     |      |
| gat  | gcg  | cat | gag | ggc | cgc | ctt  | tca | tat | atg | aga | agc  | aaa | aag | gtc | 4059 |
| Asp  | Ala  | His | Glu | Gly | Arg | Leu  | Ser | Tyr | Met | Arg | Ser  | Lys | Lys | Val |      |
| 1340 | 1340 |     |     |     |     | 1345 |     |     |     |     | 1350 |     |     |     |      |
| agc  | aac  | tgt | aat | ctg | tat | cgc  | ctt | gga | aaa | aag | aag  | gga | cta | ccc | 4104 |
| Ser  | Asn  | Cys | Asn | Leu | Tyr | Arg  | Leu | Gly | Lys | Lys | Lys  | Gly | Leu | Pro |      |
| 1355 | 1355 |     |     |     |     | 1360 |     |     |     |     | 1365 |     |     |     |      |
| agc  | cgc  | atg | gtg | gtg | tca | ata  | ttt | gat | ccc | cct | gtg  | aat | tgg | ctt | 4149 |
| Ser  | Arg  | Met | Val | Val | Ser | Ile  | Phe | Asp | Pro | Pro | Val  | Asn | Trp | Leu |      |
| 1370 | 1370 |     |     |     |     | 1375 |     |     |     |     | 1380 |     |     |     |      |
| cct  | cct  | ggg | tat | gta | gta | aat  | caa | gac | aaa | agc | aac  | aca | gat | aaa | 4194 |
| Pro  | Pro  | Gly | Tyr | Val | Val | Asn  | Gln | Asp | Lys | Ser | Asn  | Thr | Asp | Lys |      |
| 1385 | 1385 |     |     |     |     | 1390 |     |     |     |     | 1395 |     |     |     |      |
| tgg  | gaa  | aaa | gat | gaa | atg | aca  | aaa | gac | tgc | atg | ctg  | gcg | aat | ggc | 4239 |
| Trp  | Glu  | Lys | Asp | Glu | Met | Thr  | Lys | Asp | Cys | Met | Leu  | Ala | Asn | Gly |      |
| 1400 | 1400 |     |     |     |     | 1405 |     |     |     |     | 1410 |     |     |     |      |
| aaa  | ctg  | gat | gag | gat | tac | gag  | gag | gag | gat | gag | gag  | gag | gag | agc | 4284 |
| Lys  | Leu  | Asp | Glu | Asp | Tyr | Glu  | Glu | Glu | Asp | Glu | Glu  | Glu | Glu | Ser |      |
| 1415 | 1415 |     |     |     |     | 1420 |     |     |     |     | 1425 |     |     |     |      |
| ctg  | atg  | tgg | agg | gct | ccg | aag  | gaa | gag | gct | gac | tat  | gaa | gat | gat | 4329 |
| Leu  | Met  | Trp | Arg | Ala | Pro | Lys  | Glu | Glu | Ala | Asp | Tyr  | Glu | Asp | Asp |      |
| 1430 | 1430 |     |     |     |     | 1435 |     |     |     |     | 1440 |     |     |     |      |
| ttc  | ctg  | gag | tat | gat | cag | gaa  | cat | atc | aga | ttt | ata  | gat | aat | atg | 4374 |
| Phe  | Leu  | Glu | Tyr | Asp | Gln | Glu  | His | Ile | Arg | Phe | Ile  | Asp | Asn | Met |      |
| 1445 | 1445 |     |     |     |     | 1450 |     |     |     |     | 1455 |     |     |     |      |
| tta  | atg  | ggg | tca | gga | gct | ttt  | gta | aag | aaa | atc | tct  | ctt | tct | cct | 4419 |
| Leu  | Met  | Gly | Ser | Gly | Ala | Phe  | Val | Lys | Lys | Ile | Ser  | Leu | Ser | Pro |      |
| 1460 | 1460 |     |     |     |     | 1465 |     |     |     |     | 1470 |     |     |     |      |
| ttt  | tca  | acc | act | gat | tct | gca  | tat | gaa | tgg | aaa | atg  | ccc | aaa | aaa | 4464 |
| Phe  | Ser  | Thr | Thr | Asp | Ser | Ala  | Tyr | Glu | Trp | Lys | Met  | Pro | Lys | Lys |      |
| 1475 | 1475 |     |     |     |     | 1480 |     |     |     |     | 1485 |     |     |     |      |
| tcc  | tcc  | tta | ggg | agt | atg | cca  | ttt | tca | tca | gat | ttt  | gag | gat | ttt | 4509 |

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|     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |      |
|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|------|
| Ser | Ser  | Leu | Gly | Ser | Met | Pro  | Phe | Ser | Ser | Asp | Phe  | Glu | Asp | Phe |      |
|     | 1490 |     |     |     |     | 1495 |     |     |     |     | 1500 |     |     |     |      |
| gac | tac  | agc | tct | tgg | gat | gca  | atg | tgc | tat | ctg | gat  | cct | agc | aaa | 4554 |
| Asp | Tyr  | Ser | Ser | Trp | Asp | Ala  | Met | Cys | Tyr | Leu | Asp  | Pro | Ser | Lys |      |
|     | 1505 |     |     |     |     | 1510 |     |     |     |     | 1515 |     |     |     |      |
| gct | gtt  | gaa | gaa | gat | gac | ttt  | gtg | gtg | ggg | ttc | tgg  | aat | cca | tca | 4599 |
| Ala | Val  | Glu | Glu | Asp | Asp | Phe  | Val | Val | Gly | Phe | Trp  | Asn | Pro | Ser |      |
|     | 1520 |     |     |     |     | 1525 |     |     |     |     | 1530 |     |     |     |      |
| gaa | gaa  | aac | tgt | ggt | gtt | gac  | acg | gga | aag | cag | tcc  | att | tct | tac | 4644 |
| Glu | Glu  | Asn | Cys | Gly | Val | Asp  | Thr | Gly | Lys | Gln | Ser  | Ile | Ser | Tyr |      |
|     | 1535 |     |     |     |     | 1540 |     |     |     |     | 1545 |     |     |     |      |
| gac | ttg  | cac | act | gag | cag | tgt  | att | gct | gac | aaa | agc  | ata | gcg | gac | 4689 |
| Asp | Leu  | His | Thr | Glu | Gln | Cys  | Ile | Ala | Asp | Lys | Ser  | Ile | Ala | Asp |      |
|     | 1550 |     |     |     |     | 1555 |     |     |     |     | 1560 |     |     |     |      |
| tgt | gtg  | gaa | gcc | ctg | ctg | ggc  | tgc | tat | tta | acc | agc  | tgt | ggg | gag | 4734 |
| Cys | Val  | Glu | Ala | Leu | Leu | Gly  | Cys | Tyr | Leu | Thr | Ser  | Cys | Gly | Glu |      |
|     | 1565 |     |     |     |     | 1570 |     |     |     |     | 1575 |     |     |     |      |
| agg | gct  | gct | cag | ctt | ttc | ctc  | tgt | tca | ctg | ggg | ctg  | aag | gtg | ctc | 4779 |
| Arg | Ala  | Ala | Gln | Leu | Phe | Leu  | Cys | Ser | Leu | Gly | Leu  | Lys | Val | Leu |      |
|     | 1580 |     |     |     |     | 1585 |     |     |     |     | 1590 |     |     |     |      |
| ccg | gta  | att | aaa | agg | act | gat  | cgg | gaa | aag | gcc | ctg  | tgc | cct | act | 4824 |
| Pro | Val  | Ile | Lys | Arg | Thr | Asp  | Arg | Glu | Lys | Ala | Leu  | Cys | Pro | Thr |      |
|     | 1595 |     |     |     |     | 1600 |     |     |     |     | 1605 |     |     |     |      |
| cgg | gag  | aat | ttc | aac | agc | caa  | caa | aag | aac | ctt | tca  | gtg | agc | tgt | 4869 |
| Arg | Glu  | Asn | Phe | Asn | Ser | Gln  | Gln | Lys | Asn | Leu | Ser  | Val | Ser | Cys |      |
|     | 1610 |     |     |     |     | 1615 |     |     |     |     | 1620 |     |     |     |      |
| gct | gct  | gct | tct | gtg | gcc | agt  | tca | cgc | tct | tct | gta  | ttg | aaa | gac | 4914 |
| Ala | Ala  | Ala | Ser | Val | Ala | Ser  | Ser | Arg | Ser | Ser | Val  | Leu | Lys | Asp |      |
|     | 1625 |     |     |     |     | 1630 |     |     |     |     | 1635 |     |     |     |      |
| tcg | gaa  | tat | ggt | tgt | ttg | aag  | att | cca | cca | aga | tgt  | atg | ttt | gat | 4959 |
| Ser | Glu  | Tyr | Gly | Cys | Leu | Lys  | Ile | Pro | Pro | Arg | Cys  | Met | Phe | Asp |      |
|     | 1640 |     |     |     |     | 1645 |     |     |     |     | 1650 |     |     |     |      |
| cat | cca  | gat | gca | gat | aaa | aca  | ctg | aat | cac | ctt | ata  | tcg | ggg | ttt | 5004 |
| His | Pro  | Asp | Ala | Asp | Lys | Thr  | Leu | Asn | His | Leu | Ile  | Ser | Gly | Phe |      |
|     | 1655 |     |     |     |     | 1660 |     |     |     |     | 1665 |     |     |     |      |
| gaa | aat  | ttt | gaa | aag | aaa | atc  | aac | tac | aga | ttc | aag  | aat | aag | gct | 5049 |
| Glu | Asn  | Phe | Glu | Lys | Lys | Ile  | Asn | Tyr | Arg | Phe | Lys  | Asn | Lys | Ala |      |
|     | 1670 |     |     |     |     | 1675 |     |     |     |     | 1680 |     |     |     |      |
| tac | ctt  | ctc | cag | gct | ttt | aca  | cat | gcc | tcc | tac | cac  | tac | aat | act | 5094 |
| Tyr | Leu  | Leu | Gln | Ala | Phe | Thr  | His | Ala | Ser | Tyr | His  | Tyr | Asn | Thr |      |
|     | 1685 |     |     |     |     | 1690 |     |     |     |     | 1695 |     |     |     |      |
| atc | act  | gat | tgt | tac | cag | cgc  | tta | gaa | ttc | ctg | gga  | gat | gcg | att | 5139 |
| Ile | Thr  | Asp | Cys | Tyr | Gln | Arg  | Leu | Glu | Phe | Leu | Gly  | Asp | Ala | Ile |      |
|     | 1700 |     |     |     |     | 1705 |     |     |     |     | 1710 |     |     |     |      |
| ttg | gac  | tac | ctc | ata | acc | aag  | cac | ctt | tat | gaa | gac  | ccg | cgg | cag | 5184 |
| Leu | Asp  | Tyr | Leu | Ile | Thr | Lys  | His | Leu | Tyr | Glu | Asp  | Pro | Arg | Gln |      |
|     | 1715 |     |     |     |     | 1720 |     |     |     |     | 1725 |     |     |     |      |
| cac | tcc  | ccg | ggg | gtc | ctg | aca  | gac | ctg | cgg | tct | gcc  | ctg | gtc | aac | 5229 |
| His | Ser  | Pro | Gly | Val | Leu | Thr  | Asp | Leu | Arg | Ser | Ala  | Leu | Val | Asn |      |
|     | 1730 |     |     |     |     | 1735 |     |     |     |     | 1740 |     |     |     |      |
| aac | acc  | atc | ttt | gca | tcg | ctg  | gct | gta | aag | tac | gac  | tac | cac | aag | 5274 |
| Asn | Thr  | Ile | Phe | Ala | Ser | Leu  | Ala | Val | Lys | Tyr | Asp  | Tyr | His | Lys |      |
|     | 1745 |     |     |     |     | 1750 |     |     |     |     | 1755 |     |     |     |      |
| tac | ttc  | aaa | gct | gtc | tct | cct  | gag | ctc | ttc | cat | gtc  | att | gat | gac | 5319 |
| Tyr | Phe  | Lys | Ala | Val | Ser | Pro  | Glu | Leu | Phe | His | Val  | Ile | Asp | Asp |      |
|     | 1760 |     |     |     |     | 1765 |     |     |     |     | 1770 |     |     |     |      |
| ttt | gtg  | cag | ttt | cag | ctt | gag  | aag | aat | gaa | atg | caa  | gga | atg | gat | 5364 |
| Phe | Val  | Gln | Phe | Gln | Leu | Glu  | Lys | Asn | Glu | Met | Gln  | Gly | Met | Asp |      |
|     | 1775 |     |     |     |     | 1780 |     |     |     |     | 1785 |     |     |     |      |
| tct | gag  | ctt | agg | aga | tct | gag  | gag | gat | gaa | gag | aaa  | gaa | gag | gat | 5409 |
| Ser | Glu  | Leu | Arg | Arg | Ser | Glu  | Glu | Asp | Glu | Glu | Lys  | Glu | Glu | Asp |      |
|     | 1790 |     |     |     |     | 1795 |     |     |     |     | 1800 |     |     |     |      |
| att | gaa  | gtt | cca | aag | gcc | atg  | ggg | gat | att | ttt | gag  | tcg | ctt | gct | 5454 |

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|      |     |     |     |     |     |      |     |     |     |     |      |     |     |     |      |
|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|------|
| Ile  | Glu | Val | Pro | Lys | Ala | Met  | Gly | Asp | Ile | Phe | Glu  | Ser | Leu | Ala |      |
| 1805 |     |     |     |     |     | 1810 |     |     |     |     | 1815 |     |     |     |      |
| ggg  | gcc | att | tac | atg | gat | agt  | ggg | atg | tca | ctg | gag  | aca | gtc | tgg | 5499 |
| Gly  | Ala | Ile | Tyr | Met | Asp | Ser  | Gly | Met | Ser | Leu | Glu  | Thr | Val | Trp |      |
| 1820 |     |     |     |     |     | 1825 |     |     |     |     | 1830 |     |     |     |      |
| cag  | gtg | tac | tat | ccc | atg | atg  | cgg | cca | cta | ata | gaa  | aag | ttt | tct | 5544 |
| Gln  | Val | Tyr | Tyr | Pro | Met | Met  | Arg | Pro | Leu | Ile | Glu  | Lys | Phe | Ser |      |
| 1835 |     |     |     |     |     | 1840 |     |     |     |     | 1845 |     |     |     |      |
| gca  | aat | gta | ccc | cgt | tcc | cct  | gtg | cga | gaa | ttg | ctt  | gaa | atg | gaa | 5589 |
| Ala  | Asn | Val | Pro | Arg | Ser | Pro  | Val | Arg | Glu | Leu | Leu  | Glu | Met | Glu |      |
| 1850 |     |     |     |     |     | 1855 |     |     |     |     | 1860 |     |     |     |      |
| cca  | gaa | act | gcc | aaa | ttt | agc  | ccg | gct | gag | aga | act  | tac | gac | ggg | 5634 |
| Pro  | Glu | Thr | Ala | Lys | Phe | Ser  | Pro | Ala | Glu | Arg | Thr  | Tyr | Asp | Gly |      |
| 1865 |     |     |     |     |     | 1870 |     |     |     |     | 1875 |     |     |     |      |
| aag  | gtc | aga | gtc | act | gtg | gaa  | gta | gta | gga | aag | ggg  | aaa | ttt | aaa | 5679 |
| Lys  | Val | Arg | Val | Thr | Val | Glu  | Val | Val | Gly | Lys | Gly  | Lys | Phe | Lys |      |
| 1880 |     |     |     |     |     | 1885 |     |     |     |     | 1890 |     |     |     |      |
| ggg  | gtt | ggg | cga | agt | tac | agg  | att | gcc | aaa | tct | gca  | gca | gca | aga | 5724 |
| Gly  | Val | Gly | Arg | Ser | Tyr | Arg  | Ile | Ala | Lys | Ser | Ala  | Ala | Ala | Arg |      |
| 1895 |     |     |     |     |     | 1900 |     |     |     |     | 1905 |     |     |     |      |
| aga  | gcc | ctc | cga | agc | ctc | aaa  | gct | aat | caa | cct | cag  | gtt | ccc | aat | 5769 |
| Arg  | Ala | Leu | Arg | Ser | Leu | Lys  | Ala | Asn | Gln | Pro | Gln  | Val | Pro | Asn |      |
| 1910 |     |     |     |     |     | 1915 |     |     |     |     | 1920 |     |     |     |      |
| agc  | tga |     |     |     |     |      |     |     |     |     |      |     |     |     | 5775 |
| Ser  |     |     |     |     |     |      |     |     |     |     |      |     |     |     |      |

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 <211> 1924  
 <212> PRT  
 <213> Homo sapiens

<400> 2

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Lys | Ser | Pro | Ala | Leu | Gln | Pro | Leu | Ser | Met | Ala | Gly | Leu | Gln | Leu |
| 1   |     |     |     | 5   |     |     |     | 10  |     |     |     |     | 15  |     |     |
| Met | Thr | Pro | Ala | Ser | Ser | Pro | Met | Gly | Pro | Phe | Phe | Gly | Leu | Pro | Trp |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Gln | Gln | Glu | Ala | Ile | His | Asp | Asn | Ile | Tyr | Thr | Pro | Arg | Lys | Tyr | Gln |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Val | Glu | Leu | Leu | Glu | Ala | Ala | Leu | Asp | His | Asn | Thr | Ile | Val | Cys | Leu |
|     | 50  |     |     |     | 55  |     |     |     |     |     | 60  |     |     |     |     |
| Asn | Thr | Gly | Ser | Gly | Lys | Thr | Phe | Ile | Ala | Ser | Thr | Thr | Leu | Leu | Lys |
| 65  |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |     |
| Ser | Cys | Leu | Tyr | Leu | Asp | Leu | Gly | Glu | Thr | Ser | Ala | Arg | Asn | Gly | Lys |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |     |
| Arg | Thr | Val | Phe | Leu | Val | Asn | Ser | Ala | Asn | Gln | Val | Ala | Gln | Gln | Val |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Ser | Ala | Val | Arg | Thr | His | Ser | Asp | Leu | Lys | Val | Gly | Glu | Tyr | Ser | Asn |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Leu | Glu | Val | Asn | Ala | Ser | Trp | Thr | Lys | Glu | Arg | Trp | Asn | Gln | Glu | Phe |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Thr | Lys | His | Gln | Val | Leu | Ile | Met | Thr | Cys | Tyr | Val | Ala | Leu | Asn | Val |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     | 160 |     |



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Leu Lys Asn Gly Tyr 165 Leu Ser Leu Ser Asp Ile Asn Leu Leu Val Phe 175  
 Asp Glu Cys His 180 Leu Ala Ile Leu Asp His Pro Tyr Arg Glu Phe Met 190  
 Lys Leu Cys 195 Glu Ile Cys Pro Ser 200 Cys Pro Arg Ile Leu Gly Leu Thr 205  
 Ala Ser Ile Leu Asn Gly Lys Trp Asp Pro Glu Asp Leu Glu Glu Lys 210 220  
 Phe Gln Lys Leu Glu Lys 230 Ile Leu Lys Ser Asn Ala Glu Thr Ala Thr 240 250  
 Asp Leu Val Val Leu 245 Asp Arg Tyr Thr Ser Gln Pro Cys Glu Ile Val 255  
 Val Asp Cys Gly 260 Pro Phe Thr Asp Arg Ser Gly Leu Tyr Glu Arg Leu 270  
 Leu Met Glu 275 Leu Glu Glu Ala Leu 280 Asn Phe Ile Asn Asp Cys Asn Ile 285  
 Ser Val His Ser Lys Glu Arg 295 Asp Ser Thr Leu Ile Ser Lys Gln Ile 300  
 Leu Ser Asp Cys Arg Ala 310 Val Leu Val Val Leu Gly Pro Trp Cys Ala 320 330  
 Asp Lys Val Ala Gly 325 Met Met Val Arg Glu Leu Gln Lys Tyr Ile Lys 335  
 His Glu Gln Glu Glu Leu His Arg Lys 345 Phe Leu Leu Phe Thr Asp Thr 350  
 Phe Leu Arg Lys Ile His Ala Leu Cys Glu Glu His Phe Ser Pro Ala 355 365  
 Ser Leu Asp Leu Lys Phe Val 375 Thr Pro Lys Val Ile Lys Leu Leu Glu 380  
 Ile Leu Arg Lys Tyr Lys 390 Pro Tyr Glu Arg His Ser Phe Glu Ser Val 400 410  
 Glu Trp Tyr Asn Asn 405 Arg Asn Gln Asp Asn Tyr Val Ser Trp Ser Asp 415  
 Ser Glu Asp Asp 420 Asp Glu Asp Glu Glu Ile Glu Glu Lys Glu Lys Pro 430 440  
 Glu Thr Asn Phe Pro Ser Pro Phe Thr Asn Ile Leu Cys Gly Ile Ile 435 445  
 Phe Val Glu Arg Arg Tyr Thr Ala Val Val Leu Asn Arg Leu Ile Lys 450 455 460  
 Glu Ala Gly Lys Gln Asp 470 Pro Glu Leu Ala Tyr Ile Ser Ser Asn Phe 475 480 485  
 Ile Thr Gly His Gly 485 Ile Gly Lys Asn Gln Pro Arg Asn Asn Thr Met 490 495

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Glu Ala Glu Phe Arg Lys Gln Glu Glu Val Leu Arg Lys Phe Arg Ala  
500 505 510

His Glu Thr Asn Leu Leu Ile Ala Thr Ser Ile Val Glu Glu Gly Val  
515 520 525

Asp Ile Pro Lys Cys Asn Leu Val Val Arg Phe Asp Leu Pro Thr Glu  
530 535 540

Tyr Arg Ser Tyr Val Gln Ser Lys Gly Arg Ala Arg Ala Pro Ile Ser  
545 550 555 560

Asn Tyr Ile Met Leu Ala Asp Thr Asp Lys Ile Lys Ser Phe Glu Glu  
565 570 575

Asp Leu Lys Thr Tyr Lys Ala Ile Glu Lys Ile Leu Arg Asn Lys Cys  
580 585 590

Ser Lys Ser Val Asp Thr Gly Glu Thr Asp Ile Asp Pro Val Met Asp  
595 600 605

Asp Asp His Val Phe Pro Pro Tyr Val Leu Arg Pro Asp Asp Gly Gly  
610 615 620

Pro Arg Val Thr Ile Asn Thr Ala Ile Gly His Ile Asn Arg Tyr Cys  
625 630 635 640

Ala Arg Leu Pro Ser Asp Pro Phe Thr His Leu Ala Pro Lys Cys Arg  
645 650 655

Thr Arg Glu Leu Pro Asp Gly Thr Phe Tyr Ser Thr Leu Tyr Leu Pro  
660 665 670

Ile Asn Ser Pro Leu Arg Ala Ser Ile Val Gly Pro Pro Met Ser Cys  
675 680 685

Val Arg Leu Ala Glu Arg Val Val Ala Leu Ile Cys Cys Glu Lys Leu  
690 695 700

His Lys Ile Gly Glu Leu Asp Asp His Leu Met Pro Val Gly Lys Glu  
705 710 715 720

Thr Val Lys Tyr Glu Glu Glu Leu Asp Leu His Asp Glu Glu Glu Thr  
725 730 735

Ser Val Pro Gly Arg Pro Gly Ser Thr Lys Arg Arg Gln Cys Tyr Pro  
740 745 750

Lys Ala Ile Pro Glu Cys Leu Arg Asp Ser Tyr Pro Arg Pro Asp Gln  
755 760 765

Pro Cys Tyr Leu Tyr Val Ile Gly Met Val Leu Thr Thr Pro Leu Pro  
770 775 780

Asp Glu Leu Asn Phe Arg Arg Arg Lys Leu Tyr Pro Pro Glu Asp Thr  
785 790 795 800

Thr Arg Cys Phe Gly Ile Leu Thr Ala Lys Pro Ile Pro Gln Ile Pro  
805 810 815

His Phe Pro Val Tyr Thr Arg Ser Gly Glu Val Thr Ile Ser Ile Glu  
820 825 830

GNCA-P03-007SequenceListing.txt

Leu Lys Lys Ser Gly Phe Met Leu Ser Leu Gln Met Leu Glu Leu Ile  
 835 840 845  
 Thr Arg Leu His Gln Tyr Ile Phe Ser His Ile Leu Arg Leu Glu Lys  
 850 855 860  
 Pro Ala Leu Glu Phe Lys Pro Thr Asp Ala Asp Ser Ala Tyr Cys Val  
 865 870 875 880  
 Leu Pro Leu Asn Val Val Asn Asp Ser Ser Thr Leu Asp Ile Asp Phe  
 885 890 895  
 Lys Phe Met Glu Asp Ile Glu Lys Ser Glu Ala Arg Ile Gly Ile Pro  
 900 905 910  
 Ser Thr Lys Tyr Thr Lys Glu Thr Pro Phe Val Phe Lys Leu Glu Asp  
 915 920 925  
 Tyr Gln Asp Ala Val Ile Ile Pro Arg Tyr Arg Asn Phe Asp Gln Pro  
 930 935 940  
 His Arg Phe Tyr Val Ala Asp Val Tyr Thr Asp Leu Thr Pro Leu Ser  
 945 950 955 960  
 Lys Phe Pro Ser Pro Glu Tyr Glu Thr Phe Ala Glu Tyr Tyr Lys Thr  
 965 970 975  
 Lys Tyr Asn Leu Asp Leu Thr Asn Leu Asn Gln Pro Leu Leu Asp Val  
 980 985 990  
 Asp His Thr Ser Ser Arg Leu Asn Leu Leu Thr Pro Arg His Leu Asn  
 995 1000 1005  
 Gln Lys Gly Lys Ala Leu Pro Leu Ser Ser Ala Glu Lys Arg Lys  
 1010 1015 1020  
 Ala Lys Trp Glu Ser Leu Gln Asn Lys Gln Ile Leu Val Pro Glu  
 1025 1030 1035  
 Leu Cys Ala Ile His Pro Ile Pro Ala Ser Leu Trp Arg Lys Ala  
 1040 1045 1050  
 Val Cys Leu Pro Ser Ile Leu Tyr Arg Leu His Cys Leu Leu Thr  
 1055 1060 1065  
 Ala Glu Glu Leu Arg Ala Gln Thr Ala Ser Asp Ala Gly Val Gly  
 1070 1075 1080  
 Val Arg Ser Leu Pro Ala Asp Phe Arg Tyr Pro Asn Leu Asp Phe  
 1085 1090 1095  
 Gly Trp Lys Lys Ser Ile Asp Ser Lys Ser Phe Ile Ser Ile Ser  
 1100 1105 1110  
 Asn Ser Ser Ser Ala Glu Asn Asp Asn Tyr Cys Lys His Ser Thr  
 1115 1120 1125  
 Ile Val Pro Glu Asn Ala Ala His Gln Gly Ala Asn Arg Thr Ser  
 1130 1135 1140  
 Ser Leu Glu Asn His Asp Gln Met Ser Val Asn Cys Arg Thr Leu  
 1145 1150 1155

## GNCA-P03-007SequenceListing.txt

Leu Ser Glu Ser Pro Gly Lys Leu His Val Glu Val Ser Ala Asp  
 1160 1165 1170  
 Leu Thr Ala Ile Asn Gly Leu Ser Tyr Asn Gln Asn Leu Ala Asn  
 1175 1180 1185  
 Gly Ser Tyr Asp Leu Ala Asn Arg Asp Phe Cys Gln Gly Asn Gln  
 1190 1195 1200  
 Leu Asn Tyr Tyr Lys Gln Glu Ile Pro Val Gln Pro Thr Thr Ser  
 1205 1210 1215  
 Tyr Ser Ile Gln Asn Leu Tyr Ser Tyr Glu Asn Gln Pro Gln Pro  
 1220 1225 1230  
 Ser Asp Glu Cys Thr Leu Leu Ser Asn Lys Tyr Leu Asp Gly Asn  
 1235 1240 1245  
 Ala Asn Lys Ser Thr Ser Asp Gly Ser Pro Val Met Ala Val Met  
 1250 1255 1260  
 Pro Gly Thr Thr Asp Thr Ile Gln Val Leu Lys Gly Arg Met Asp  
 1265 1270 1275  
 Ser Glu Gln Ser Pro Ser Ile Gly Tyr Ser Ser Arg Thr Leu Gly  
 1280 1285 1290  
 Pro Asn Pro Gly Leu Ile Leu Gln Ala Leu Thr Leu Ser Asn Ala  
 1295 1300 1305  
 Ser Asp Gly Phe Asn Leu Glu Arg Leu Glu Met Leu Gly Asp Ser  
 1310 1315 1320  
 Phe Leu Lys His Ala Ile Thr Thr Tyr Leu Phe Cys Thr Tyr Pro  
 1325 1330 1335  
 Asp Ala His Glu Gly Arg Leu Ser Tyr Met Arg Ser Lys Lys Val  
 1340 1345 1350  
 Ser Asn Cys Asn Leu Tyr Arg Leu Gly Lys Lys Lys Gly Leu Pro  
 1355 1360 1365  
 Ser Arg Met Val Val Ser Ile Phe Asp Pro Pro Val Asn Trp Leu  
 1370 1375 1380  
 Pro Pro Gly Tyr Val Val Asn Gln Asp Lys Ser Asn Thr Asp Lys  
 1385 1390 1395  
 Trp Glu Lys Asp Glu Met Thr Lys Asp Cys Met Leu Ala Asn Gly  
 1400 1405 1410  
 Lys Leu Asp Glu Asp Tyr Glu Glu Glu Asp Glu Glu Glu Ser  
 1415 1420 1425  
 Leu Met Trp Arg Ala Pro Lys Glu Glu Ala Asp Tyr Glu Asp Asp  
 1430 1435 1440  
 Phe Leu Glu Tyr Asp Gln Glu His Ile Arg Phe Ile Asp Asn Met  
 1445 1450 1455  
 Leu Met Gly Ser Gly Ala Phe Val Lys Lys Ile Ser Leu Ser Pro  
 1460 1465 1470

## GNCA-P03-007SequenceListing.txt

|      |     |     |     |     |     |      |     |     |     |     |      |     |     |     |
|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|
| Phe  | Ser | Thr | Thr | Asp | Ser | Ala  | Tyr | Glu | Trp | Lys | Met  | Pro | Lys | Lys |
| 1475 |     |     |     |     |     | 1480 |     |     |     |     | 1485 |     |     |     |
| Ser  | Ser | Leu | Gly | Ser | Met | Pro  | Phe | Ser | Ser | Asp | Phe  | Glu | Asp | Phe |
| 1490 |     |     |     |     |     | 1495 |     |     |     |     | 1500 |     |     |     |
| Asp  | Tyr | Ser | Ser | Trp | Asp | Ala  | Met | Cys | Tyr | Leu | Asp  | Pro | Ser | Lys |
| 1505 |     |     |     |     |     | 1510 |     |     |     |     | 1515 |     |     |     |
| Ala  | Val | Glu | Glu | Asp | Asp | Phe  | Val | Val | Gly | Phe | Trp  | Asn | Pro | Ser |
| 1520 |     |     |     |     |     | 1525 |     |     |     |     | 1530 |     |     |     |
| Glu  | Glu | Asn | Cys | Gly | Val | Asp  | Thr | Gly | Lys | Gln | Ser  | Ile | Ser | Tyr |
| 1535 |     |     |     |     |     | 1540 |     |     |     |     | 1545 |     |     |     |
| Asp  | Leu | His | Thr | Glu | Gln | Cys  | Ile | Ala | Asp | Lys | Ser  | Ile | Ala | Asp |
| 1550 |     |     |     |     |     | 1555 |     |     |     |     | 1560 |     |     |     |
| Cys  | Val | Glu | Ala | Leu | Leu | Gly  | Cys | Tyr | Leu | Thr | Ser  | Cys | Gly | Glu |
| 1565 |     |     |     |     |     | 1570 |     |     |     |     | 1575 |     |     |     |
| Arg  | Ala | Ala | Gln | Leu | Phe | Leu  | Cys | Ser | Leu | Gly | Leu  | Lys | Val | Leu |
| 1580 |     |     |     |     |     | 1585 |     |     |     |     | 1590 |     |     |     |
| Pro  | Val | Ile | Lys | Arg | Thr | Asp  | Arg | Glu | Lys | Ala | Leu  | Cys | Pro | Thr |
| 1595 |     |     |     |     |     | 1600 |     |     |     |     | 1605 |     |     |     |
| Arg  | Glu | Asn | Phe | Asn | Ser | Gln  | Gln | Lys | Asn | Leu | Ser  | Val | Ser | Cys |
| 1610 |     |     |     |     |     | 1615 |     |     |     |     | 1620 |     |     |     |
| Ala  | Ala | Ala | Ser | Val | Ala | Ser  | Ser | Arg | Ser | Ser | Val  | Leu | Lys | Asp |
| 1625 |     |     |     |     |     | 1630 |     |     |     |     | 1635 |     |     |     |
| Ser  | Glu | Tyr | Gly | Cys | Leu | Lys  | Ile | Pro | Pro | Arg | Cys  | Met | Phe | Asp |
| 1640 |     |     |     |     |     | 1645 |     |     |     |     | 1650 |     |     |     |
| His  | Pro | Asp | Ala | Asp | Lys | Thr  | Leu | Asn | His | Leu | Ile  | Ser | Gly | Phe |
| 1655 |     |     |     |     |     | 1660 |     |     |     |     | 1665 |     |     |     |
| Glu  | Asn | Phe | Glu | Lys | Lys | Ile  | Asn | Tyr | Arg | Phe | Lys  | Asn | Lys | Ala |
| 1670 |     |     |     |     |     | 1675 |     |     |     |     | 1680 |     |     |     |
| Tyr  | Leu | Leu | Gln | Ala | Phe | Thr  | His | Ala | Ser | Tyr | His  | Tyr | Asn | Thr |
| 1685 |     |     |     |     |     | 1690 |     |     |     |     | 1695 |     |     |     |
| Ile  | Thr | Asp | Cys | Tyr | Gln | Arg  | Leu | Glu | Phe | Leu | Gly  | Asp | Ala | Ile |
| 1700 |     |     |     |     |     | 1705 |     |     |     |     | 1710 |     |     |     |
| Leu  | Asp | Tyr | Leu | Ile | Thr | Lys  | His | Leu | Tyr | Glu | Asp  | Pro | Arg | Gln |
| 1715 |     |     |     |     |     | 1720 |     |     |     |     | 1725 |     |     |     |
| His  | Ser | Pro | Gly | Val | Leu | Thr  | Asp | Leu | Arg | Ser | Ala  | Leu | Val | Asn |
| 1730 |     |     |     |     |     | 1735 |     |     |     |     | 1740 |     |     |     |
| Asn  | Thr | Ile | Phe | Ala | Ser | Leu  | Ala | Val | Lys | Tyr | Asp  | Tyr | His | Lys |
| 1745 |     |     |     |     |     | 1750 |     |     |     |     | 1755 |     |     |     |
| Tyr  | Phe | Lys | Ala | Val | Ser | Pro  | Glu | Leu | Phe | His | Val  | Ile | Asp | Asp |
| 1760 |     |     |     |     |     | 1765 |     |     |     |     | 1770 |     |     |     |
| Phe  | Val | Gln | Phe | Gln | Leu | Glu  | Lys | Asn | Glu | Met | Gln  | Gly | Met | Asp |
| 1775 |     |     |     |     |     | 1780 |     |     |     |     | 1785 |     |     |     |

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Ser Glu Leu Arg Arg Ser Glu Glu Asp Glu Glu Lys Glu Glu Asp  
1790 1795 1800

Ile Glu Val Pro Lys Ala Met Gly Asp Ile Phe Glu Ser Leu Ala  
1805 1810 1815

Gly Ala Ile Tyr Met Asp Ser Gly Met Ser Leu Glu Thr Val Trp  
1820 1825 1830

Gln Val Tyr Tyr Pro Met Met Arg Pro Leu Ile Glu Lys Phe Ser  
1835 1840 1845

Ala Asn Val Pro Arg Ser Pro Val Arg Glu Leu Leu Glu Met Glu  
1850 1855 1860

Pro Glu Thr Ala Lys Phe Ser Pro Ala Glu Arg Thr Tyr Asp Gly  
1865 1870 1875

Lys Val Arg Val Thr Val Glu Val Val Gly Lys Gly Lys Phe Lys  
1880 1885 1890

Gly Val Gly Arg Ser Tyr Arg Ile Ala Lys Ser Ala Ala Ala Arg  
1895 1900 1905

Arg Ala Leu Arg Ser Leu Lys Ala Asn Gln Pro Gln Val Pro Asn  
1910 1915 1920

Ser

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<212> DNA  
<213> Drosophila melanogaster

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<222> (1)..(6750)  
<223>

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1 5 10 15  
ccg cgc gac ttt cag gtg gag cta ctg gcc acc gcc tac gag cgg aac 96  
Pro Arg Asp Phe Gln Val Glu Leu Ala Thr Ala Tyr Glu Arg Asn  
20 25 30  
acg att att tgc ctg ggc cat cga agt tcc aag gag ttt ata gcc ctc 144  
Thr Ile Ile Cys Leu Gly His Arg Ser Ser Lys Glu Phe Ile Ala Leu  
35 40 45  
aag ctg ctc cag gag ctg tgc cgt cga gca cgc cga cat ggt cgt gtc 192  
Lys Leu Leu Gln Glu Leu Ser Arg Arg Ala Arg Arg His Gly Arg Val  
50 55 60  
agt gtc tat ctc agt tgc gag gtt ggc acc agc acg gaa cca tgc tcc 240  
Ser Val Tyr Leu Ser Cys Glu Val Gly Thr Ser Thr Glu Pro Cys Ser  
65 70 75 80  
atc tac acg atg ctc acc cac ttg act gac ctg cgg gtg tgg cag gag 288  
Ile Tyr Thr Met Leu Thr His Leu Thr Asp Leu Arg Val Trp Gln Glu  
85 90 95  
cag ccg gat atg caa att ccc ttt gat cat tgc tgg acg gac tat cac 336  
Gln Pro Asp Met Gln Ile Pro Phe Asp His Cys Trp Thr Asp Tyr His  
100 105 110  
gtt tcc atc cta cgg cca gag gga ttt ctt tat ctg ctc gaa act cgc 384

## GNCA-P03-007SequenceListing.txt

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Val | Ser | Ile | Leu | Arg | Pro | Glu | Gly | Phe | Leu | Tyr | Leu | Leu | Glu | Thr | Arg |      |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |      |
| gag | ctg | ctg | ctg | agc | agc | gtc | gaa | ctg | atc | gtg | ctg | gaa | gat | tgt | cat | 432  |
| Glu | Leu | Leu | Leu | Ser | Ser | Val | Glu | Leu | Ile | Val | Leu | Glu | Asp | Cys | His |      |
|     |     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |      |
| gac | agc | gcc | gtt | tat | cag | agg | ata | agg | cct | ctg | ttc | gag | aat | cac | att | 480  |
| Asp | Ser | Ala | Val | Tyr | Gln | Arg | Ile | Arg | Pro | Leu | Phe | Glu | Asn | His | Ile |      |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |      |
| atg | cca | gcg | cca | ccg | gac | agg | cca | cgg | att | ctc | gga | ctc | gct | gga |     | 528  |
| Met | Pro | Ala | Pro | Pro | Ala | Asp | Arg | Pro | Arg | Ile | Leu | Gly | Leu | Ala | Gly |      |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |      |
| ccg | ctg | cac | agc | gcc | gga | tgt | gag | ctg | cag | caa | ctg | agc | gcc | atg | ctg | 576  |
| Pro | Leu | His | Ser | Ala | Gly | Cys | Glu | Leu | Gln | Gln | Leu | Ser | Ala | Met | Leu |      |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |      |
| gcc | acc | ctg | gag | cag | agt | gtg | ctt | tgc | cag | atc | gag | acg | gcc | agt | gat | 624  |
| Ala | Thr | Leu | Glu | Gln | Ser | Val | Leu | Cys | Gln | Ile | Glu | Thr | Ala | Ser | Asp |      |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |      |
| att | gtc | acc | gtg | ttg | cgt | tac | tgt | tcc | cga | ccg | cac | gaa | tac | atc | gta | 672  |
| Ile | Val | Thr | Val | Leu | Arg | Tyr | Cys | Ser | Arg | Pro | His | Glu | Tyr | Ile | Val |      |
|     |     | 210 |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |      |
| cag | tgc | gcc | ccc | ttc | gag | atg | gac | gaa | ctg | tcc | ctg | gtg | ctt | gcc | gat | 720  |
| Gln | Cys | Ala | Pro | Phe | Glu | Met | Asp | Glu | Leu | Ser | Leu | Val | Leu | Ala | Asp |      |
| 225 |     |     |     |     | 230 |     |     |     | 235 |     |     |     |     |     | 240 |      |
| gtg | ctc | aac | aca | cac | aag | tcc | ttt | tta | ttg | gac | cac | cgc | tac | gat | ccc | 768  |
| Val | Leu | Asn | Thr | His | Lys | Ser | Phe | Leu | Leu | Asp | His | Arg | Tyr | Asp | Pro |      |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |      |
| tac | gaa | atc | tac | ggc | aca | gac | cag | ttt | atg | gac | gaa | ctg | aaa | gac | ata | 816  |
| Tyr | Glu | Ile | Tyr | Gly | Thr | Asp | Gln | Phe | Met | Asp | Glu | Leu | Lys | Asp | Ile |      |
|     |     |     | 260 |     |     |     | 265 |     |     |     |     |     | 270 |     |     |      |
| ccc | gat | ccc | aag | gtg | gac | ccc | ctg | aac | gtc | atc | aac | tca | cta | ctg | gtc | 864  |
| Pro | Asp | Pro | Lys | Val | Asp | Pro | Leu | Asn | Val | Ile | Asn | Ser | Leu | Leu | Val |      |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |      |
| gtg | ctg | cac | gag | atg | ggt | cct | tgg | tgc | acg | cag | cgg | gct | gca | cat | cac | 912  |
| Val | Leu | His | Glu | Met | Gly | Pro | Trp | Cys | Thr | Gln | Arg | Ala | Ala | His | His |      |
|     |     | 290 |     |     |     | 295 |     |     |     |     | 300 |     |     |     |     |      |
| ttt | tac | caa | tgc | aat | gag | aag | tta | aag | gtg | aag | acg | ccg | cac | gaa | cgt | 960  |
| Phe | Tyr | Gln | Cys | Asn | Glu | Lys | Leu | Lys | Val | Lys | Thr | Pro | His | Glu | Arg |      |
| 305 |     |     |     |     | 310 |     |     |     |     | 315 |     |     |     |     | 320 |      |
| cac | tac | ttg | ctg | tac | tgc | cta | gtg | agc | acg | gcc | ctt | atc | caa | ctg | tac | 1008 |
| His | Tyr | Leu | Leu | Tyr | Cys | Leu | Val | Ser | Thr | Ala | Leu | Ile | Gln | Leu | Tyr |      |
|     |     |     |     | 325 |     |     |     |     | 330 |     |     |     |     | 335 |     |      |
| tcc | ctc | tgc | gaa | cac | gca | ttc | cat | cga | cat | tta | gga | agt | ggc | agc | gat | 1056 |
| Ser | Leu | Cys | Glu | His | Ala | Phe | His | Arg | His | Leu | Gly | Ser | Gly | Ser | Asp |      |
|     |     |     | 340 |     |     |     |     | 345 |     |     |     |     | 350 |     |     |      |
| tca | cgc | cag | acc | atc | gaa | cgc | tat | tcc | agc | ccc | aag | gtg | cga | cgt | ctg | 1104 |
| Ser | Arg | Gln | Thr | Ile | Glu | Arg | Tyr | Ser | Ser | Pro | Lys | Val | Arg | Arg | Leu |      |
|     |     | 355 |     |     |     |     | 360 |     |     |     |     | 365 |     |     |     |      |
| ttg | cag | aca | ctg | agg | tgc | ttc | aag | ccg | gaa | gag | gtg | cac | acc | caa | gcg | 1152 |
| Leu | Gln | Thr | Leu | Arg | Cys | Phe | Lys | Pro | Glu | Glu | Val | His | Thr | Gln | Ala |      |
|     |     | 370 |     |     |     | 375 |     |     |     |     | 380 |     |     |     |     |      |
| gac | gga | ctg | cgc | aga | atg | cgg | cat | cag | gtg | gat | cag | gcg | gac | ttc | aat | 1200 |
| Asp | Gly | Leu | Arg | Arg | Met | Arg | His | Gln | Val | Asp | Gln | Ala | Asp | Phe | Asn |      |
| 385 |     |     |     |     | 390 |     |     |     |     | 395 |     |     |     |     | 400 |      |
| cgg | tta | tct | cat | acg | ctg | gaa | agc | aag | tgc | cga | atg | gtg | gat | caa | atg | 1248 |
| Arg | Leu | Ser | His | Thr | Leu | Glu | Ser | Lys | Cys | Arg | Met | Val | Asp | Gln | Met |      |
|     |     |     |     | 405 |     |     |     |     | 410 |     |     |     |     | 415 |     |      |
| gac | caa | ccg | ccg | acg | gag | aca | cga | gcc | ctg | gtg | gcc | act | ctt | gag | cag | 1296 |
| Asp | Gln | Pro | Pro | Thr | Glu | Thr | Arg | Ala | Leu | Val | Ala | Thr | Leu | Glu | Gln |      |
|     |     |     | 420 |     |     |     |     | 425 |     |     |     |     | 430 |     |     |      |
| att | ctg | cac | acg | aca | gag | gac | agg | cag | acg | aac | aga | agc | gcc | gct | cgg | 1344 |
| Ile | Leu | His | Thr | Thr | Glu | Asp | Arg | Gln | Thr | Asn | Arg | Ser | Ala | Ala | Arg |      |
|     |     | 435 |     |     |     |     | 440 |     |     |     |     | 445 |     |     |     |      |
| gtg | act | cct | act | cct | act | ccc | gct | cat | gcg | aag | ccg | aaa | cct | agc | tct | 1392 |

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|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |      |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| Val | Thr | Pro | Thr | Pro | Thr | Pro | Ala | His | Ala | Lys | Pro | Lys | Pro | Ser | Ser |      |
| 450 |     |     |     |     |     | 455 |     |     |     |     | 460 |     |     |     |     |      |
| ggt | gcc | aac | act | gca | caa | cca | cga | act | cgt | aga | cgt | gtg | tac | acc | agg | 1440 |
| Gly | Ala | Asn | Thr | Ala | Gln | Pro | Arg | Thr | Arg | Arg | Arg | Val | Tyr | Thr | Arg |      |
| 465 |     |     |     |     | 470 |     |     |     |     | 475 |     |     |     |     | 480 |      |
| cgc | cac | cac | cgg | gat | cac | aat | gat | ggc | agc | gac | acg | ctc | tgc | gca | ctg | 1488 |
| Arg | His | His | Arg | Asp | His | Asn | Asp | Gly | Ser | Asp | Thr | Leu | Cys | Ala | Leu |      |
|     |     |     |     | 485 |     |     |     |     | 490 |     |     |     |     | 495 |     |      |
| att | tac | tgc | aac | cag | aac | cac | acg | gct | cgc | gtg | ctc | ttt | gag | ctt | cta | 1536 |
| Ile | Tyr | Cys | Asn | Gln | Asn | His | Thr | Ala | Arg | Val | Leu | Phe | Glu | Leu | Leu |      |
|     |     |     | 500 |     |     |     |     | 505 |     |     |     | 510 |     |     |     |      |
| gcg | gag | att | agc | aga | cgt | gat | ccc | gat | ctc | aag | ttc | cta | cgc | tgc | cag | 1584 |
| Ala | Glu | Ile | Ser | Arg | Arg | Asp | Pro | Asp | Leu | Lys | Phe | Leu | Arg | Cys | Gln |      |
|     |     | 515 |     |     |     |     | 520 |     |     |     |     | 525 |     |     |     |      |
| tac | acc | acg | gac | cgg | gtg | gca | gat | ccc | acc | acg | gag | ccc | aaa | gag | gct | 1632 |
| Tyr | Thr | Thr | Asp | Arg | Val | Ala | Asp | Pro | Thr | Thr | Glu | Pro | Lys | Glu | Ala |      |
|     |     | 530 |     |     |     | 535 |     |     |     |     | 540 |     |     |     |     |      |
| gag | ttg | gag | cac | cgg | cgg | cag | gaa | gag | gtg | cta | aag | cgc | ttc | cgc | atg | 1680 |
| Glu | Leu | Glu | His | Arg | Arg | Gln | Glu | Glu | Val | Leu | Lys | Arg | Phe | Arg | Met |      |
| 545 |     |     |     |     | 550 |     |     |     |     | 555 |     |     |     |     | 560 |      |
| cat | gac | tgc | aat | gtc | ctg | atc | ggc | act | tcg | gtg | ctg | gaa | gag | ggc | atc | 1728 |
| His | Asp | Cys | Asn | Val | Leu | Ile | Gly | Thr | Ser | Val | Leu | Glu | Glu | Gly | Ile |      |
|     |     |     |     | 565 |     |     |     |     | 570 |     |     |     |     | 575 |     |      |
| gat | gtg | ccc | aag | tgc | aat | ttg | ggt | gtg | cgc | tgg | gat | ccg | cca | acc | aca | 1776 |
| Asp | Val | Pro | Lys | Cys | Asn | Leu | Val | Val | Arg | Trp | Asp | Pro | Pro | Thr | Thr |      |
|     |     |     | 580 |     |     |     |     | 585 |     |     |     |     | 590 |     |     |      |
| tat | cgc | agt | tac | gtt | cag | tgc | aaa | ggc | cga | gcc | cgt | gct | gct | cca | gcc | 1824 |
| Tyr | Arg | Ser | Tyr | Val | Gln | Cys | Lys | Gly | Arg | Ala | Arg | Ala | Ala | Pro | Ala |      |
|     |     | 595 |     |     |     |     | 600 |     |     |     |     | 605 |     |     |     |      |
| tat | cat | gtc | att | ctc | gtc | gct | ccg | agt | tat | aaa | agc | cca | act | gtg | ggg | 1872 |
| Tyr | His | Val | Ile | Leu | Val | Ala | Pro | Ser | Tyr | Lys | Ser | Pro | Thr | Val | Gly |      |
|     |     | 610 |     |     |     | 615 |     |     |     |     | 620 |     |     |     |     |      |
| tca | gtg | cag | ctg | acc | gat | cgg | agt | cat | cgg | tat | att | tgc | gcg | act | ggc | 1920 |
| Ser | Val | Gln | Leu | Thr | Asp | Arg | Ser | His | Arg | Tyr | Ile | Cys | Ala | Thr | Gly |      |
| 625 |     |     |     |     | 630 |     |     |     |     | 635 |     |     |     |     | 640 |      |
| gat | act | aca | gag | gcg | gac | agc | gac | tct | gat | gat | tca | gcg | atg | cca | aac | 1968 |
| Asp | Thr | Thr | Glu | Ala | Asp | Ser | Asp | Ser | Asp | Asp | Ser | Ala | Met | Pro | Asn |      |
|     |     |     |     | 645 |     |     |     |     | 650 |     |     |     |     | 655 |     |      |
| tcg | tcc | ggc | tcg | gat | ccc | tat | act | ttt | ggc | acg | gca | cgc | gga | acc | gtg | 2016 |
| Ser | Ser | Gly | Ser | Asp | Pro | Tyr | Thr | Phe | Gly | Thr | Ala | Arg | Gly | Thr | Val |      |
|     |     |     | 660 |     |     |     |     | 665 |     |     |     |     | 670 |     |     |      |
| aag | atc | ctc | aac | ccc | gaa | gtg | ttc | agt | aaa | caa | cca | ccg | aca | gcg | tgc | 2064 |
| Lys | Ile | Leu | Asn | Pro | Glu | Val | Phe | Ser | Lys | Gln | Pro | Pro | Thr | Ala | Cys |      |
|     |     | 675 |     |     |     |     | 680 |     |     |     |     | 685 |     |     |     |      |
| gac | att | aag | ctg | cag | gag | atc | cag | gac | gaa | ttg | cca | gcc | gca | gcg | cag | 2112 |
| Asp | Ile | Lys | Leu | Gln | Glu | Ile | Gln | Asp | Glu | Leu | Pro | Ala | Ala | Ala | Gln |      |
|     |     | 690 |     |     |     | 695 |     |     |     |     | 700 |     |     |     |     |      |
| ctg | gat | acg | agc | aac | tcc | agc | gac | gaa | gcc | gtc | agc | atg | agt | aac | acg | 2160 |
| Leu | Asp | Thr | Ser | Asn | Ser | Ser | Asp | Glu | Ala | Val | Ser | Met | Ser | Asn | Thr |      |
| 705 |     |     |     |     | 710 |     |     |     |     | 715 |     |     |     |     | 720 |      |
| tct | cca | agc | gag | agc | agt | aca | gaa | caa | aaa | tcc | aga | cgc | ttc | cag | tgc | 2208 |
| Ser | Pro | Ser | Glu | Ser | Ser | Thr | Glu | Gln | Lys | Ser | Arg | Arg | Phe | Gln | Cys |      |
|     |     |     | 725 |     |     |     |     |     | 730 |     |     |     |     | 735 |     |      |
| gag | ctg | agc | tct | tta | acg | gag | cca | gaa | gac | aca | agt | gat | act | aca | gcc | 2256 |
| Glu | Leu | Ser | Ser | Leu | Thr | Glu | Pro | Glu | Asp | Thr | Ser | Asp | Thr | Thr | Ala |      |
|     |     |     | 740 |     |     |     |     | 745 |     |     |     |     | 750 |     |     |      |
| gaa | atc | gat | act | gct | cat | agt | tta | gcc | agc | acc | acg | aag | gac | ttg | gtg | 2304 |
| Glu | Ile | Asp | Thr | Ala | His | Ser | Leu | Ala | Ser | Thr | Thr | Lys | Asp | Leu | Val |      |
|     |     | 755 |     |     |     |     | 760 |     |     |     |     | 765 |     |     |     |      |
| cat | caa | atg | gca | cag | tat | cgc | gaa | atc | gag | cag | atg | ctg | cta | tcc | aag | 2352 |
| His | Gln | Met | Ala | Gln | Tyr | Arg | Glu | Ile | Glu | Gln | Met | Leu | Leu | Ser | Lys |      |
|     |     | 770 |     |     |     | 775 |     |     |     |     | 780 |     |     |     |     |      |
| tgc | gcc | aac | aca | gag | ccg | ccg | gag | cag | gag | cag | agt | gag | gcg | gaa | cgt | 2400 |



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|     |     |     |     |      |     |      |      |     |     |     |      |      |     |     |     |  |      |
|-----|-----|-----|-----|------|-----|------|------|-----|-----|-----|------|------|-----|-----|-----|--|------|
| Cys | Ala | Asn | Thr | Glu  | Pro | Pro  | Glu  | Gln | Glu | Gln | Ser  | Glu  | Ala | Glu | Arg |  |      |
| 785 |     |     |     |      | 790 |      |      |     | 795 |     |      |      |     |     | 800 |  |      |
| ttt | agt | gcc | tgc | ctg  | gcc | gca  | tac  | cga | ccc | aag | ccg  | cac  | ctg | cta | aca |  | 2448 |
| Phe | Ser | Ala | Cys | Leu  | Ala | Ala  | Tyr  | Arg | Pro | Lys | Pro  | His  | Leu | Leu | Thr |  |      |
|     |     |     |     | 805  |     |      |      |     | 810 |     |      |      |     | 815 |     |  |      |
| ggc | gcc | tcc | gtg | gat  | ctg | ggt  | tct  | gct | ata | gct | ttg  | gtc  | aac | aag | tac |  | 2496 |
| Gly | Ala | Ser | Val | Asp  | Leu | Gly  | Ser  | Ala | Ile | Ala | Leu  | Val  | Asn | Lys | Tyr |  |      |
|     |     |     |     | 820  |     |      |      | 825 |     |     |      |      | 830 |     |     |  |      |
| tgc | gcc | cga | ctg | cca  | agc | gac  | acg  | ttc | acc | aag | ttg  | acg  | gcg | ttg | tgg |  | 2544 |
| Cys | Ala | Arg | Leu | Pro  | Ser | Asp  | Thr  | Phe | Thr | Lys | Leu  | Thr  | Ala | Leu | Trp |  |      |
|     |     |     |     | 835  |     |      | 840  |     |     |     |      | 845  |     |     |     |  |      |
| cgc | tgc | acc | cga | aac  | gaa | agg  | gct  | gga | gtg | acc | ctg  | ttt  | cag | tac | aca |  | 2592 |
| Arg | Cys | Thr | Arg | Asn  | Glu | Arg  | Ala  | Gly | Val | Thr | Leu  | Phe  | Gln | Tyr | Thr |  |      |
|     |     |     |     | 850  |     | 855  |      |     |     |     | 860  |      |     |     |     |  |      |
| ctc | cgt | ctg | ccc | atc  | aac | tcg  | cca  | ttg | aag | cat | gac  | att  | gtg | ggt | ctt |  | 2640 |
| Leu | Arg | Leu | Pro | Ile  | Asn | Ser  | Pro  | Leu | Lys | His | Asp  | Ile  | Val | Gly | Leu |  |      |
| 865 |     |     |     | 870  |     |      |      |     |     | 875 |      |      |     | 880 |     |  |      |
| ccg | atg | cca | act | caa  | aca | ttg  | gcc  | cgc | cga | ctg | gct  | gcc  | ttg | cag | gct |  | 2688 |
| Pro | Met | Pro | Thr | Gln  | Thr | Leu  | Ala  | Arg | Arg | Leu | Ala  | Ala  | Leu | Gln | Ala |  |      |
|     |     |     |     | 885  |     |      |      |     | 890 |     |      |      |     | 895 |     |  |      |
| tgc | gtg | gaa | ctg | cac  | agg | atc  | ggt  | gag | tta | gac | gat  | cag  | ttg | cag | cct |  | 2736 |
| Cys | Val | Glu | Leu | His  | Arg | Ile  | Gly  | Glu | Leu | Asp | Asp  | Gln  | Leu | Gln | Pro |  |      |
|     |     |     |     | 900  |     |      | 905  |     |     |     |      | 910  |     |     |     |  |      |
| atc | ggc | aag | gag | gga  | ttt | cgt  | gcc  | ctg | gag | ccg | gac  | tgg  | gag | tgc | ttt |  | 2784 |
| Ile | Gly | Lys | Glu | Gly  | Phe | Arg  | Ala  | Leu | Glu | Pro | Asp  | Trp  | Glu | Cys | Phe |  |      |
|     |     |     |     | 915  |     |      | 920  |     |     |     |      | 925  |     |     |     |  |      |
| gaa | ctg | gag | cca | gag  | gac | gaa  | cag  | att | gtg | cag | cta  | agc  | gat | gaa | cca |  | 2832 |
| Glu | Leu | Glu | Pro | Glu  | Asp | Glu  | Gln  | Ile | Val | Gln | Leu  | Ser  | Asp | Glu | Pro |  |      |
|     |     |     |     | 930  |     | 935  |      |     |     | 940 |      |      |     |     |     |  |      |
| cgt | ccg | gga | aca | acg  | aag | cgt  | cgt  | cag | tac | tat | tac  | aaa  | cgc | att | gca |  | 2880 |
| Arg | Pro | Gly | Thr | Thr  | Lys | Arg  | Arg  | Gln | Tyr | Tyr | Tyr  | Lys  | Arg | Ile | Ala |  |      |
| 945 |     |     |     | 950  |     |      |      |     | 955 |     |      |      |     | 960 |     |  |      |
| tcc | gaa | ttt | tgc | gat  | tgc | cgt  | ccc  | gtt | gcc | gga | gcg  | cca  | tgc | tat | ttg |  | 2928 |
| Ser | Glu | Phe | Cys | Asp  | Cys | Arg  | Pro  | Val | Ala | Gly | Ala  | Pro  | Cys | Tyr | Leu |  |      |
|     |     |     |     | 965  |     |      |      | 970 |     |     |      |      | 975 |     |     |  |      |
| tac | ttt | atc | caa | ctg  | acg | ctc  | caa  | tgt | ccg | att | ccc  | gaa  | gag | caa | aac |  | 2976 |
| Tyr | Phe | Ile | Gln | Leu  | Thr | Leu  | Gln  | Cys | Pro | Ile | Pro  | Glu  | Glu | Gln | Asn |  |      |
|     |     |     |     | 980  |     |      |      | 985 |     |     |      |      | 990 |     |     |  |      |
| acg | cgg | gga | cgc | aag  | att | tat  | ccg  | ccc | gaa | gat | gcg  | cag  | cag | gga | ttc |  | 3024 |
| Thr | Arg | Gly | Arg | Lys  | Ile | Tyr  | Pro  | Pro | Glu | Asp | Ala  | Gln  | Gln | Gly | Phe |  |      |
|     |     |     |     | 995  |     |      | 1000 |     |     |     |      | 1005 |     |     |     |  |      |
| ggc | att | cta | acc | acc  | aaa | cgg  | ata  | ccc | aag | ctg | agt  | gct  | ttc | tcg |     |  | 3069 |
| Gly | Ile | Leu | Thr | Thr  | Lys | Arg  | Ile  | Pro | Lys | Leu | Ser  | Ala  | Phe | Ser |     |  |      |
|     |     |     |     | 1010 |     | 1015 |      |     |     |     | 1020 |      |     |     |     |  |      |
| ata | ttc | acg | cgt | tcc  | ggt | gag  | gtg  | aag | gtt | tcc | ctg  | gag  | tta | gct |     |  | 3114 |
| Ile | Phe | Thr | Arg | Ser  | Gly | Glu  | Val  | Lys | Val | Ser | Leu  | Glu  | Leu | Ala |     |  |      |
|     |     |     |     | 1025 |     | 1030 |      |     |     |     | 1035 |      |     |     |     |  |      |
| aag | gaa | cgc | gtg | att  | cta | act  | agc  | gaa | caa | ata | gtc  | tgc  | atc | aac |     |  | 3159 |
| Lys | Glu | Arg | Val | Ile  | Leu | Thr  | Ser  | Glu | Gln | Ile | Val  | Cys  | Ile | Asn |     |  |      |
|     |     |     |     | 1040 |     | 1045 |      |     |     |     | 1050 |      |     |     |     |  |      |
| gga | ttt | tta | aac | tac  | acg | ttc  | acc  | aat | gta | ctg | cgt  | ttg  | caa | aag |     |  | 3204 |
| Gly | Phe | Leu | Asn | Tyr  | Thr | Phe  | Thr  | Asn | Val | Leu | Arg  | Leu  | Gln | Lys |     |  |      |
|     |     |     |     | 1055 |     | 1060 |      |     |     |     | 1065 |      |     |     |     |  |      |
| ttt | ctg | atg | ctc | ttc  | gat | ccg  | gac  | tcc | acg | gaa | aat  | tgt  | gta | ttc |     |  | 3249 |
| Phe | Leu | Met | Leu | Phe  | Asp | Pro  | Asp  | Ser | Thr | Glu | Asn  | Cys  | Val | Phe |     |  |      |
|     |     |     |     | 1070 |     | 1075 |      |     |     |     | 1080 |      |     |     |     |  |      |
| att | gtg | ccc | acc | gtg  | aag | gca  | cca  | gct | ggc | ggc | aag  | cac  | atc | gac |     |  | 3294 |
| Ile | Val | Pro | Thr | Val  | Lys | Ala  | Pro  | Ala | Gly | Gly | Lys  | His  | Ile | Asp |     |  |      |
|     |     |     |     | 1085 |     | 1090 |      |     |     |     | 1095 |      |     |     |     |  |      |
| tgg | cag | ttt | ctg | gag  | ctg | atc  | caa  | gcg | aat | gga | aat  | aca  | atg | cca |     |  | 3339 |
| Trp | Gln | Phe | Leu | Glu  | Leu | Ile  | Gln  | Ala | Asn | Gly | Asn  | Thr  | Met | Pro |     |  |      |
|     |     |     |     | 1100 |     | 1105 |      |     |     |     | 1110 |      |     |     |     |  |      |
| cgg | gca | gtg | ccc | gat  | gag | gag  | cgc  | cag | gcg | cag | ccg  | ttt  | gat | ccg |     |  | 3384 |

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|     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |      |
|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|------|
| Arg | Ala  | Val | Pro | Asp | Glu | Glu  | Arg | Gln | Ala | Gln | Pro  | Phe | Asp | Pro |      |
| caa | 1115 | ttc | cag | gat | gcc | 1120 | gtt | atg | ccg | tgg | 1125 | cgc | aac | cag | 3429 |
| Gln | Arg  | Phe | Gln | Asp | Ala | Val  | Val | Met | Pro | Trp | Tyr  | Arg | Asn | Gln |      |
| gat | 1130 | ccg | cag | tat | ttc | 1135 | gtg | gcg | gag | ata | 1140 | cca | cat | cta | 3474 |
| Asp | Gln  | Pro | Gln | Tyr | Phe | Tyr  | Val | Ala | Glu | Ile | Cys  | Pro | His | Leu |      |
| tcc | 1145 | ctc | agc | tgc | ttc | 1150 | ggt | gac | aac | tac | 1155 | acg | ttc | aag | 3519 |
| Ser | Pro  | Leu | Ser | Cys | Phe | Pro  | Gly | Asp | Asn | Tyr | Arg  | Thr | Phe | Lys |      |
| cac | 1160 | tac | ctc | gtc | aag | 1165 | ggt | ctg | acc | ata | 1170 | aat | acc | tcg | 3564 |
| His | Tyr  | Tyr | Leu | Val | Lys | Tyr  | Gly | Leu | Thr | Ile | Gln  | Asn | Thr | Ser |      |
| cag | 1175 | ccg | cta | ttg | gac | 1180 | cac | acc | agt | gcg | 1185 | tta | aac | ttc | 3609 |
| Gln | Pro  | Leu | Leu | Asp | Val | Asp  | His | Thr | Ser | Ala | Arg  | Leu | Asn | Phe |      |
| ctc | 1190 | cca | cga | tac | gtt | 1195 | cg  | aag | ggc | gtt | 1200 | ctg | ccc | act | 3654 |
| Leu | Thr  | Pro | Arg | Tyr | Val | Asn  | Arg | Lys | Gly | Val | Ala  | Leu | Pro | Thr |      |
| agt | 1205 | gag | gag | aca | aag | 1210 | gca | aag | cg  | gag | 1215 | ctc | gaa | cag | 3699 |
| Ser | Ser  | Glu | Glu | Thr | Lys | Arg  | Ala | Lys | Arg | Glu | Asn  | Leu | Glu | Gln |      |
| aag | 1220 | atc | ctt | gtg | cca | 1225 | ctc | tgc | act | gtg | 1230 | cca | ttc | ccc | 3744 |
| Lys | Gln  | Ile | Leu | Val | Pro | gag  | Leu | Cys | Thr | Val | 1245 | Pro | Phe | Pro |      |
| gcc | 1235 | ttg | tgg | cga | act | 1240 | gtg | tgc | ctg | ccc | 1245 | atc | ctg | tac | 3789 |
| Ala | Ser  | Leu | Trp | Arg | Thr | Ala  | Val | Cys | Leu | Pro | 1260 | Ile | Leu | Tyr |      |
| cg  | 1250 | aat | ggt | ctt | cta | 1255 | gcc | gac | gat | att | 1260 | aaa | cag | gtt | 3834 |
| Arg | Ile  | Asn | Gly | Leu | Leu | ttg  | Ala | Asp | Asp | Ile | 1275 | Lys | Gln | Val |      |
| tct | 1265 | gag | ctg | ggg | ctg | 1270 | agg | caa | cag | atc | 1275 | gat | gag | gat | 3879 |
| Ser | Ala  | Asp | Leu | Gly | Leu | Gly  | Arg | Gln | Gln | Ile | 1290 | Asp | Glu | Asp |      |
| ttc | 1280 | gag | ttg | ccc | atg | 1285 | ttt | ggg | tgg | agt | 1290 | tcg | gag | gtg | 3924 |
| Phe | Glu  | Trp | Pro | Met | Leu | gac  | Phe | Gly | Trp | Ser | 1305 | Ser | Glu | Val |      |
| ctc | 1295 | aaa | tcg | cg  | gag | 1300 | aaa | caa | aag | gag | 1305 | ctt | aag | gat | 3969 |
| Leu | Lys  | Lys | Ser | Arg | Glu | tcc  | Lys | Gln | Lys | Glu | 1320 | Leu | Lys | Asp |      |
| gat | 1310 | att | aat | ggc | aaa | 1315 | tta | gct | gat | gtt | 1320 | aag | aaa | ccg | 4014 |
| Asp | Thr  | Ile | Asn | Gly | Lys | gac  | Leu | Ala | Asp | Val | 1335 | Lys | Lys | Pro |      |
| act | 1325 | gag | gag | acc | caa | 1330 | gat | aag | gat | tca | 1335 | gac | gat | aag | 4059 |
| Thr | Ser  | Glu | Glu | Thr | Gln | cta  | Asp | Lys | Asp | Ser | 1350 | Asp | Asp | Lys |      |
| gtt | 1340 | aaa | agt | gct | att | 1345 | cta | atc | att | gag | 1350 | gag | gag | aag | 4104 |
| Val | Glu  | Lys | Ser | Ala | Ile | gaa  | Leu | Ile | Ile | Glu | 1365 | Glu | Glu | Lys |      |
| ctg | 1355 | caa | gag | gct | gat | 1360 | att | gag | ata | ggc | 1365 | tgg | tca | aac | 4149 |
| Leu | Gln  | Glu | Ala | Asp | Asp | ttc  | Ile | Glu | Ile | Gly | 1380 | Trp | Ser | Asn |      |
| gat | 1370 | gcc | gac | gat | ata | 1375 | agt | ttt | aac | caa | 1380 | gac | gac | gac | 4194 |
| Asp | Met  | Ala | Asp | Asp | Ile | gct  | Ser | Phe | Asn | Gln | 1395 | Asp | Asp | Asp |      |
| gag | 1385 | gac | gcc | ttc | cat | 1390 | cca | gtt | tta | ccg | 1395 | aac | gtt | aag | 4239 |
| Glu | Asp  | Asp | Ala | Phe | His | Leu  | Pro | Val | Leu | Pro | 1410 | Asn | Val | Lys |      |
| ttc | 1400 | tgt | gat | cag | caa | 1405 | tac | ggt | tcg | ccc | 1410 | ttt | tgg | gat | 4284 |
| Phe | Cys  | Asp | Gln | Gln | Thr | cg   | Tyr | Gly | Ser | Pro | 1425 | Phe | Trp | Asp |      |
| gtg | 1415 | aat | ggc | gaa | agc | 1420 | ttc | aag | ggt | cca | 1425 | agc | agt | cag | 4329 |
|     |      |     |     |     |     | ggc  |     |     |     |     |      |     |     |     |      |

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| Val | Ser | Asn | Gly | Glu | Ser | Gly | Phe | Lys | Gly | Pro | Lys | Ser | Ser | Gln |      |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| aat | aag | cag | ggg | ggc | aag | ggc | aaa | gca | aag | ggg | ccg | gca | aag | ccc | 4374 |
| Asn | Lys | Gln | Gly | Gly | Lys | Gly | Lys | Ala | Lys | Gly | Pro | Ala | Lys | Pro |      |
| aca | ttt | aac | tat | tat | gac | tcg | gac | aat | tcg | ctg | ggg | tcc | agc | tac | 4419 |
| Thr | Phe | Asn | Tyr | Tyr | Asp | Ser | Asp | Asn | Ser | Leu | Gly | Ser | Ser | Tyr |      |
| gat | gac | gac | gat | aac | gca | ggg | ccg | ctc | aat | tac | atg | cat | cac | aac | 4464 |
| Asp | Asp | Asp | Asp | Asn | Ala | Gly | Pro | Leu | Asn | Tyr | Met | His | His | Asn |      |
| tac | agt | tcg | gat | gac | gac | gat | gtg | gca | gat | gat | atc | gat | gcg | gga | 4509 |
| Tyr | Ser | Ser | Asp | Asp | Asp | Asp | Val | Ala | Asp | Asp | Ile | Asp | Ala | Gly |      |
| cgc | att | gcg | ttc | acc | tcc | aag | aat | gaa | gcg | gag | act | att | gaa | acc | 4554 |
| Arg | Ile | Ala | Phe | Thr | Ser | Lys | Asn | Glu | Ala | Glu | Thr | Ile | Glu | Thr |      |
| gca | cag | gaa | gtg | gaa | aag | cgc | cag | aag | cag | ctg | tcc | atc | atc | cag | 4599 |
| Ala | Gln | Glu | Val | Glu | Lys | Arg | Gln | Lys | Gln | Leu | Ser | Ile | Ile | Gln |      |
| gcg | acc | aat | gct | aac | gag | cgg | cag | tat | cag | cag | aca | aag | aac | ctg | 4644 |
| Ala | Thr | Asn | Ala | Asn | Glu | Arg | Gln | Tyr | Gln | Gln | Thr | Lys | Asn | Leu |      |
| ctc | att | gga | ttc | aat | ttt | aag | cat | gag | gac | cag | aag | gaa | cct | gcc | 4689 |
| Leu | Ile | Gly | Phe | Asn | Phe | Lys | His | Glu | Asp | Gln | Lys | Glu | Pro | Ala |      |
| act | ata | aga | tat | gaa | gaa | tcc | ata | gct | aag | ctc | aaa | acg | gaa | ata | 4734 |
| Thr | Ile | Arg | Tyr | Glu | Glu | Ser | Ile | Ala | Lys | Leu | Lys | Thr | Glu | Ile |      |
| gaa | tcc | ggc | ggc | atg | ttg | gtg | ccg | cac | gac | cag | cag | ttg | gtt | cta | 4779 |
| Glu | Ser | Gly | Gly | Met | Leu | Val | Pro | His | Asp | Gln | Gln | Leu | Val | Leu |      |
| aaa | aga | agt | gat | gcc | gct | gag | gct | cag | gtt | gca | aag | gta | tcg | atg | 4824 |
| Lys | Arg | Ser | Asp | Ala | Ala | Glu | Ala | Gln | Val | Ala | Lys | Val | Ser | Met |      |
| atg | gag | cta | ttg | aag | cag | ctg | ctg | ccg | tat | gta | aat | gaa | gat | gtg | 4869 |
| Met | Glu | Leu | Leu | Lys | Gln | Leu | Leu | Pro | Tyr | Val | Asn | Glu | Asp | Val |      |
| ctg | gcc | aaa | aag | ctg | ggg | gat | agg | cgc | gag | ctt | ctg | ctg | tcg | gat | 4914 |
| Leu | Ala | Lys | Lys | Leu | Gly | Asp | Arg | Arg | Glu | Leu | Leu | Leu | Ser | Asp |      |
| ttg | gta | gag | cta | aat | gca | gat | tgg | gta | gcg | cga | cat | gag | cag | gag | 4959 |
| Leu | Val | Glu | Leu | Asn | Ala | Asp | Trp | Val | Ala | Arg | His | Glu | Gln | Glu |      |
| acc | tac | aat | gta | atg | gga | tcg | gga | gat | agt | ttt | gac | aac | tat | aac | 5004 |
| Thr | Tyr | Asn | Val | Met | Gly | Cys | Gly | Asp | Ser | Phe | Asp | Asn | Tyr | Asn |      |
| gat | cat | cat | cgg | ctg | aac | ttg | gat | gaa | aag | caa | ctg | aaa | ctg | caa | 5049 |
| Asp | His | His | Arg | Leu | Asn | Leu | Asp | Glu | Lys | Gln | Leu | Lys | Leu | Gln |      |
| tac | gaa | cga | att | gaa | att | gag | cca | cct | act | tcc | acg | aag | gcc | ata | 5094 |
| Tyr | Glu | Arg | Ile | Glu | Ile | Glu | Pro | Pro | Thr | Ser | Thr | Lys | Ala | Ile |      |
| acc | tca | gcc | ata | tta | cca | gct | ggc | ttc | agt | ttc | gat | cga | caa | ccg | 5139 |
| Thr | Ser | Ala | Ile | Leu | Pro | Ala | Gly | Phe | Ser | Phe | Asp | Arg | Gln | Pro |      |
| gat | cta | gtg | ggc | cat | cca | gga | ccc | agt | ccc | agc | atc | att | ttg | caa | 5184 |
| Asp | Leu | Val | Gly | His | Pro | Gly | Pro | Ser | Pro | Ser | Ile | Ile | Leu | Gln |      |
| gcc | ctc | aca | atg | tcc | aat | gct | aac | gat | ggc | atc | aat | ctg | gag | cga | 5229 |
| Ala | Leu | Thr | Met | Ser | Asn | Ala | Asn | Asp | Gly | Ile | Asn | Leu | Glu | Arg |      |
| ctg | gag | aca | att | gga | gat | tcc | ttt | cta | aag | tat | gcc | att | acc | acc | 5274 |

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|      |      |     |     |     |     |      |     |     |     |     |      |     |     |     |      |
|------|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|------|
| Leu  | Glu  | Thr | Ile | Gly | Asp | Ser  | Phe | Leu | Lys | Tyr | Ala  | Ile | Thr | Thr |      |
| 1745 | 1745 |     |     |     |     | 1750 |     |     |     |     | 1755 |     |     |     |      |
| tac  | ttg  | tac | atc | acc | tac | gag  | aat | gtg | cac | gag | gga  | aaa | cta | agt | 5319 |
| Tyr  | Leu  | Tyr | Ile | Thr | Tyr | Glu  | Asn | Val | His | Glu | Gly  | Lys | Leu | Ser |      |
| 1760 | 1760 |     |     |     |     | 1765 |     |     |     |     | 1770 |     |     |     |      |
| cac  | ctg  | cgc | tcc | aag | cag | gtt  | gcc | aat | ctc | aat | ctc  | tat | cgt | ctg | 5364 |
| His  | Leu  | Arg | Ser | Lys | Gln | Val  | Ala | Asn | Leu | Asn | Leu  | Tyr | Arg | Leu |      |
| 1775 | 1775 |     |     |     |     | 1780 |     |     |     |     | 1785 |     |     |     |      |
| ggc  | aga  | cgt | aag | aga | ctg | ggg  | gaa | tat | atg | ata | gcc  | act | aaa | ttc | 5409 |
| Gly  | Arg  | Arg | Lys | Arg | Leu | Gly  | Glu | Tyr | Met | Ile | Ala  | Thr | Lys | Phe |      |
| 1790 | 1790 |     |     |     |     | 1795 |     |     |     |     | 1800 |     |     |     |      |
| gag  | ccg  | cac | gac | aat | tgg | ctg  | cca | ccc | tgc | tac | tac  | gtg | cca | aag | 5454 |
| Glu  | Pro  | His | Asp | Asn | Trp | Leu  | Pro | Pro | Cys | Tyr | Tyr  | Val | Pro | Lys |      |
| 1805 | 1805 |     |     |     |     | 1810 |     |     |     |     | 1815 |     |     |     |      |
| gag  | cta  | gag | aag | gcg | ctc | atc  | gag | gcg | aag | atc | ccc  | act | cac | cat | 5499 |
| Glu  | Leu  | Glu | Lys | Ala | Leu | Ile  | Glu | Ala | Lys | Ile | Pro  | Thr | His | His |      |
| 1820 | 1820 |     |     |     |     | 1825 |     |     |     |     | 1830 |     |     |     |      |
| tgg  | aag  | ctg | gcc | gat | ctg | cta  | gac | att | aag | aac | cta  | agc | agt | gtg | 5544 |
| Trp  | Lys  | Leu | Ala | Asp | Leu | Leu  | Asp | Ile | Lys | Asn | Leu  | Ser | Ser | Val |      |
| 1835 | 1835 |     |     |     |     | 1840 |     |     |     |     | 1845 |     |     |     |      |
| caa  | atc  | tgc | gag | atg | gtt | cgc  | gaa | aaa | gcc | gat | gcc  | ctg | ggc | ttg | 5589 |
| Gln  | Ile  | Cys | Glu | Met | Val | Arg  | Glu | Lys | Ala | Asp | Ala  | Leu | Gly | Leu |      |
| 1850 | 1850 |     |     |     |     | 1855 |     |     |     |     | 1860 |     |     |     |      |
| gag  | cag  | aat | ggg | ggg | gcc | caa  | aat | gga | caa | ctt | gac  | gac | tcc | aat | 5634 |
| Glu  | Gln  | Asn | Gly | Gly | Ala | Gln  | Asn | Gly | Gln | Leu | Asp  | Asp | Ser | Asn |      |
| 1865 | 1865 |     |     |     |     | 1870 |     |     |     |     | 1875 |     |     |     |      |
| gat  | agc  | tgc | aat | gat | ttt | agc  | tgt | ttt | att | ccc | tac  | aac | ctt | gtt | 5679 |
| Asp  | Ser  | Cys | Asn | Asp | Phe | Ser  | Cys | Phe | Ile | Pro | Tyr  | Asn | Leu | Val |      |
| 1880 | 1880 |     |     |     |     | 1885 |     |     |     |     | 1890 |     |     |     |      |
| tcg  | caa  | cac | agc | att | ccg | gat  | aag | tct | att | gcc | gat  | tgc | gtc | gaa | 5724 |
| Ser  | Gln  | His | Ser | Ile | Pro | Asp  | Lys | Ser | Ile | Ala | Asp  | Cys | Val | Glu |      |
| 1895 | 1895 |     |     |     |     | 1900 |     |     |     |     | 1905 |     |     |     |      |
| gcc  | ctc  | att | gga | gcc | tat | ctc  | att | gag | tgc | gga | ccc  | cga | ggg | gct | 5769 |
| Ala  | Leu  | Ile | Gly | Ala | Tyr | Leu  | Ile | Glu | Cys | Gly | Pro  | Arg | Gly | Ala |      |
| 1910 | 1910 |     |     |     |     | 1915 |     |     |     |     | 1920 |     |     |     |      |
| tta  | ctc  | ttt | atg | gcc | tgg | ctg  | ggc | gtg | aga | gtg | ctc  | cct | atc | aca | 5814 |
| Leu  | Leu  | Phe | Met | Ala | Trp | Leu  | Gly | Val | Arg | Val | Leu  | Pro | Ile | Thr |      |
| 1925 | 1925 |     |     |     |     | 1930 |     |     |     |     | 1935 |     |     |     |      |
| agg  | cag  | ttg | gac | ggg | ggg | aac  | cag | gag | caa | cga | ata  | ccc | ggg | agc | 5859 |
| Arg  | Gln  | Leu | Asp | Gly | Gly | Asn  | Gln | Glu | Gln | Arg | Ile  | Pro | Gly | Ser |      |
| 1940 | 1940 |     |     |     |     | 1945 |     |     |     |     | 1950 |     |     |     |      |
| aca  | aaa  | ccg | aat | gcc | gaa | aat  | gtg | gtc | acc | gtt | tac  | ggg | gca | ttg | 5904 |
| Thr  | Lys  | Pro | Asn | Ala | Glu | Asn  | Val | Val | Thr | Val | Tyr  | Gly | Ala | Trp |      |
| 1955 | 1955 |     |     |     |     | 1960 |     |     |     |     | 1965 |     |     |     |      |
| ccc  | acg  | ccg | cgt | agt | cca | ctg  | ctg | cac | ttt | gct | cca  | aat | gct | acg | 5949 |
| Pro  | Thr  | Pro | Arg | Ser | Pro | Leu  | Leu | His | Phe | Ala | Pro  | Asn | Ala | Thr |      |
| 1970 | 1970 |     |     |     |     | 1975 |     |     |     |     | 1980 |     |     |     |      |
| gag  | gag  | ctg | gac | cag | tta | cta  | agc | ggc | ttt | gag | gag  | ttt | gag | gag | 5994 |
| Glu  | Glu  | Leu | Asp | Gln | Leu | Leu  | Ser | Gly | Phe | Glu | Glu  | Phe | Glu | Glu |      |
| 1985 | 1985 |     |     |     |     | 1990 |     |     |     |     | 1995 |     |     |     |      |
| agt  | ttg  | gga | tac | aag | ttc | cgg  | gat | cgg | tcg | tac | ctg  | ttg | caa | gcc | 6039 |
| Ser  | Leu  | Gly | Tyr | Lys | Phe | Arg  | Asp | Arg | Ser | Tyr | Leu  | Leu | Gln | Ala |      |
| 2000 | 2000 |     |     |     |     | 2005 |     |     |     |     | 2010 |     |     |     |      |
| atg  | aca  | cat | gcc | agt | tac | acg  | ccc | aat | cga | ttg | acg  | gat | tgc | tat | 6084 |
| Met  | Thr  | His | Ala | Ser | Tyr | Thr  | Pro | Asn | Arg | Leu | Thr  | Asp | Cys | Tyr |      |
| 2015 | 2015 |     |     |     |     | 2020 |     |     |     |     | 2025 |     |     |     |      |
| cag  | cgt  | ctg | gag | ttc | ctg | ggc  | gat | gct | gtt | cta | gat  | tac | ctc | att | 6129 |
| Gln  | Arg  | Leu | Glu | Phe | Leu | Gly  | Asp | Ala | Val | Leu | Asp  | Tyr | Leu | Ile |      |
| 2030 | 2030 |     |     |     |     | 2035 |     |     |     |     | 2040 |     |     |     |      |
| acg  | cgg  | cat | tta | tac | gaa | gat  | ccc | cgc | cag | cat | tct  | cca | ggc | gca | 6174 |
| Thr  | Arg  | His | Leu | Tyr | Glu | Asp  | Pro | Arg | Gln | His | Ser  | Pro | Gly | Ala |      |
| 2045 | 2045 |     |     |     |     | 2050 |     |     |     |     | 2055 |     |     |     |      |
| tta  | acg  | gat | ttg | cgg | tca | gca  | ctg | gtg | aat | aat | aca  | ata | ttc | gcc | 6219 |

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|      |     |     |     |     |     |      |     |     |     |     |      |     |     |     |      |
|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|------|
| Leu  | Thr | Asp | Leu | Arg | Ser | Ala  | Leu | Val | Asn | Asn | Thr  | Ile | Phe | Ala |      |
| 2060 |     |     |     |     |     | 2065 |     |     |     |     | 2070 |     |     |     |      |
| tcc  | ctg | gct | gtt | cgc | cat | ggc  | ttc | cac | aag | ttc | ttc  | cgg | cac | ctc | 6264 |
| Ser  | Leu | Ala | Val | Arg | His | Gly  | Phe | His | Lys | Phe | Phe  | Arg | His | Leu |      |
| 2075 |     |     |     |     |     | 2080 |     |     |     |     | 2085 |     |     |     |      |
| tcg  | ccg | ggc | ctt | aac | gat | gtg  | att | gac | cgt | ttt | gtg  | cgg | atc | cag | 6309 |
| Ser  | Pro | Gly | Leu | Asn | Asp | Val  | Ile | Asp | Arg | Phe | Val  | Arg | Ile | Gln |      |
| 2090 |     |     |     |     |     | 2095 |     |     |     |     | 2100 |     |     |     |      |
| cag  | gag | aat | gga | cac | tgc | atc  | agt | gag | gag | tac | tac  | tta | ttg | tcc | 6354 |
| Gln  | Glu | Asn | Gly | His | Cys | Ile  | Ser | Glu | Glu | Tyr | Tyr  | Leu | Leu | Ser |      |
| 2105 |     |     |     |     |     | 2110 |     |     |     |     | 2115 |     |     |     |      |
| gag  | gag | gag | tgc | gat | gac | gcc  | gag | gac | gtt | gag | gtg  | ccc | aag | gca | 6399 |
| Glu  | Glu | Glu | Cys | Asp | Asp | Ala  | Glu | Asp | Val | Glu | Val  | Pro | Lys | Ala |      |
| 2120 |     |     |     |     |     | 2125 |     |     |     |     | 2130 |     |     |     |      |
| ttg  | ggc | gac | gtt | ttc | gag | tcg  | atc | gca | ggg | gcc | att  | ttt | ctc | gac | 6444 |
| Leu  | Gly | Asp | Val | Phe | Glu | Ser  | Ile | Ala | Gly | Ala | Ile  | Phe | Leu | Asp |      |
| 2135 |     |     |     |     |     | 2140 |     |     |     |     | 2145 |     |     |     |      |
| tca  | aac | atg | tcg | ctg | gac | gtg  | gtt | tgg | cac | gta | tat  | agc | aac | atg | 6489 |
| Ser  | Asn | Met | Ser | Leu | Asp | Val  | Val | Trp | His | Val | Tyr  | Ser | Asn | Met |      |
| 2150 |     |     |     |     |     | 2155 |     |     |     |     | 2160 |     |     |     |      |
| atg  | agc | ccg | gag | atc | gag | cag  | ttc | agc | aac | tca | gtg  | cca | aaa | tcg | 6534 |
| Met  | Ser | Pro | Glu | Ile | Glu | Gln  | Phe | Ser | Asn | Ser | Val  | Pro | Lys | Ser |      |
| 2165 |     |     |     |     |     | 2170 |     |     |     |     | 2175 |     |     |     |      |
| ccc  | att | cgg | gag | ctc | ctc | gag  | ctg | gag | ccg | gaa | acc  | gcc | aag | ttc | 6579 |
| Pro  | Ile | Arg | Glu | Leu | Leu | Glu  | Leu | Glu | Pro | Glu | Thr  | Ala | Lys | Phe |      |
| 2180 |     |     |     |     |     | 2185 |     |     |     |     | 2190 |     |     |     |      |
| ggc  | aag | ccc | gag | aag | ctg | gcg  | gat | ggg | cga | cgg | gtg  | cgc | gtt | acc | 6624 |
| Gly  | Lys | Pro | Glu | Lys | Leu | Ala  | Asp | Gly | Arg | Arg | Val  | Arg | Val | Thr |      |
| 2195 |     |     |     |     |     | 2200 |     |     |     |     | 2205 |     |     |     |      |
| gtg  | gat | gtc | ttc | tgc | aaa | gga  | acc | ttc | cgt | ggc | atc  | gga | cgc | aac | 6669 |
| Val  | Asp | Val | Phe | Cys | Lys | Gly  | Thr | Phe | Arg | Gly | Ile  | Gly | Arg | Asn |      |
| 2210 |     |     |     |     |     | 2215 |     |     |     |     | 2220 |     |     |     |      |
| tat  | cgc | att | gcc | aag | tgc | acg  | gcg | gcc | aaa | tgc | gca  | ttg | cgc | caa | 6714 |
| Tyr  | Arg | Ile | Ala | Lys | Cys | Thr  | Ala | Ala | Lys | Cys | Ala  | Leu | Arg | Gln |      |
| 2225 |     |     |     |     |     | 2230 |     |     |     |     | 2235 |     |     |     |      |
| ctc  | aaa | aag | cag | ggc | ttg | ata  | gcc | aaa | aaa | gac | taa  |     |     |     | 6750 |
| Leu  | Lys | Lys | Gln | Gly | Leu | Ile  | Ala | Lys | Lys | Asp |      |     |     |     |      |
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 Thr Ile Ile Cys Leu Gly His Arg Ser Ser Lys Glu Phe Ile Ala Leu  
 35 40 45  
 Lys Leu Leu Gln Glu Leu Ser Arg Arg Ala Arg Arg His Gly Arg Val  
 50 55 60  
 Ser Val Tyr Leu Ser Cys Glu Val Gly Thr Ser Thr Glu Pro Cys Ser  
 65 70 75 80  
 Ile Tyr Thr Met Leu Thr His Leu Thr Asp Leu Arg Val Trp Gln Glu  
 85 90 95

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Gln Pro Asp Met Gln Ile Pro Phe Asp His Cys Trp Thr Asp Tyr His  
100 105 110

Val Ser Ile Leu Arg Pro Glu Gly Phe Leu Tyr Leu Leu Glu Thr Arg  
115 120 125

Glu Leu Leu Leu Ser Ser Val Glu Leu Ile Val Leu Glu Asp Cys His  
130 135 140

Asp Ser Ala Val Tyr Gln Arg Ile Arg Pro Leu Phe Glu Asn His Ile  
145 150 155 160

Met Pro Ala Pro Pro Ala Asp Arg Pro Arg Ile Leu Gly Leu Ala Gly  
165 170 175

Pro Leu His Ser Ala Gly Cys Glu Leu Gln Gln Leu Ser Ala Met Leu  
180 185 190

Ala Thr Leu Glu Gln Ser Val Leu Cys Gln Ile Glu Thr Ala Ser Asp  
195 200 205

Ile Val Thr Val Leu Arg Tyr Cys Ser Arg Pro His Glu Tyr Ile Val  
210 215 220

Gln Cys Ala Pro Phe Glu Met Asp Glu Leu Ser Leu Val Leu Ala Asp  
225 230 235 240

Val Leu Asn Thr His Lys Ser Phe Leu Leu Asp His Arg Tyr Asp Pro  
245 250 255

Tyr Glu Ile Tyr Gly Thr Asp Gln Phe Met Asp Glu Leu Lys Asp Ile  
260 265 270

Pro Asp Pro Lys Val Asp Pro Leu Asn Val Ile Asn Ser Leu Leu Val  
275 280 285

Val Leu His Glu Met Gly Pro Trp Cys Thr Gln Arg Ala Ala His His  
290 295 300

Phe Tyr Gln Cys Asn Glu Lys Leu Lys Val Lys Thr Pro His Glu Arg  
305 310 315 320

His Tyr Leu Leu Tyr Cys Leu Val Ser Thr Ala Leu Ile Gln Leu Tyr  
325 330 335

Ser Leu Cys Glu His Ala Phe His Arg His Leu Gly Ser Gly Ser Asp  
340 345 350

Ser Arg Gln Thr Ile Glu Arg Tyr Ser Ser Pro Lys Val Arg Arg Leu  
355 360 365

Leu Gln Thr Leu Arg Cys Phe Lys Pro Glu Glu Val His Thr Gln Ala  
370 375 380

Asp Gly Leu Arg Arg Met Arg His Gln Val Asp Gln Ala Asp Phe Asn  
385 390 395 400

Arg Leu Ser His Thr Leu Glu Ser Lys Cys Arg Met Val Asp Gln Met  
405 410 415

Asp Gln Pro Pro Thr Glu Thr Arg Ala Leu Val Ala Thr Leu Glu Gln  
420 425 430

## GNCA-P03-007SequenceListing.txt

Ile Leu His Thr Thr Glu Asp Arg Gln Thr Asn Arg Ser Ala Ala Arg  
 435 440 445  
 Val Thr Pro Thr Pro Thr Pro Ala His Ala Lys Pro Lys Pro Ser Ser  
 450 455 460  
 Gly Ala Asn Thr Ala Gln Pro Arg Thr Arg Arg Val Tyr Thr Arg  
 465 470 475 480  
 Arg His His Arg Asp His Asn Asp Gly Ser Asp Thr Leu Cys Ala Leu  
 485 490 495  
 Ile Tyr Cys Asn Gln Asn His Thr Ala Arg Val Leu Phe Glu Leu Leu  
 500 505 510  
 Ala Glu Ile Ser Arg Arg Asp Pro Asp Leu Lys Phe Leu Arg Cys Gln  
 515 520 525  
 Tyr Thr Thr Asp Arg Val Ala Asp Pro Thr Thr Glu Pro Lys Glu Ala  
 530 535 540  
 Glu Leu Glu His Arg Arg Gln Glu Glu Val Leu Lys Arg Phe Arg Met  
 545 550 555 560  
 His Asp Cys Asn Val Leu Ile Gly Thr Ser Val Leu Glu Glu Gly Ile  
 565 570 575  
 Asp Val Pro Lys Cys Asn Leu Val Val Arg Trp Asp Pro Pro Thr Thr  
 580 585 590  
 Tyr Arg Ser Tyr Val Gln Cys Lys Gly Arg Ala Arg Ala Ala Pro Ala  
 595 600 605  
 Tyr His Val Ile Leu Val Ala Pro Ser Tyr Lys Ser Pro Thr Val Gly  
 610 615 620  
 Ser Val Gln Leu Thr Asp Arg Ser His Arg Tyr Ile Cys Ala Thr Gly  
 625 630 635 640  
 Asp Thr Thr Glu Ala Asp Ser Asp Ser Asp Ser Ala Met Pro Asn  
 645 650 655  
 Ser Ser Gly Ser Asp Pro Tyr Thr Phe Gly Thr Ala Arg Gly Thr Val  
 660 665 670  
 Lys Ile Leu Asn Pro Glu Val Phe Ser Lys Gln Pro Pro Thr Ala Cys  
 675 680 685  
 Asp Ile Lys Leu Gln Glu Ile Gln Asp Glu Leu Pro Ala Ala Ala Gln  
 690 695 700  
 Leu Asp Thr Ser Asn Ser Ser Asp Glu Ala Val Ser Met Ser Asn Thr  
 705 710 715 720  
 Ser Pro Ser Glu Ser Thr Thr Glu Gln Lys Ser Arg Arg Phe Gln Cys  
 725 730 735  
 Glu Leu Ser Ser Leu Thr Glu Pro Glu Asp Thr Ser Asp Thr Thr Ala  
 740 745 750  
 Glu Ile Asp Thr Ala His Ser Leu Ala Ser Thr Thr Lys Asp Leu Val  
 755 760 765

## GNCA-P03-007SequenceListing.txt

His Gln Met Ala Gln Tyr Arg Glu Ile Glu Gln Met Leu Leu Ser Lys  
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 Cys Ala Asn Thr Glu Pro Pro Glu Gln Glu Gln Ser Glu Ala Glu Arg  
 785 790 795 800  
 Phe Ser Ala Cys Leu Ala Ala Tyr Arg Pro Lys Pro His Leu Leu Thr  
 805 810 815  
 Gly Ala Ser Val Asp Leu Gly Ser Ala Ile Ala Leu Val Asn Lys Tyr  
 820 825 830  
 Cys Ala Arg Leu Pro Ser Asp Thr Phe Thr Lys Leu Thr Ala Leu Trp  
 835 840 845  
 Arg Cys Thr Arg Asn Glu Arg Ala Gly Val Thr Leu Phe Gln Tyr Thr  
 850 855 860  
 Leu Arg Leu Pro Ile Asn Ser Pro Leu Lys His Asp Ile Val Gly Leu  
 865 870 875 880  
 Pro Met Pro Thr Gln Thr Leu Ala Arg Arg Leu Ala Ala Leu Gln Ala  
 885 890 895  
 Cys Val Glu Leu His Arg Ile Gly Glu Leu Asp Asp Gln Leu Gln Pro  
 900 905 910  
 Ile Gly Lys Glu Gly Phe Arg Ala Leu Glu Pro Asp Trp Glu Cys Phe  
 915 920 925  
 Glu Leu Glu Pro Glu Asp Glu Gln Ile Val Gln Leu Ser Asp Glu Pro  
 930 935 940  
 Arg Pro Gly Thr Thr Lys Arg Arg Gln Tyr Tyr Tyr Lys Arg Ile Ala  
 945 950 955 960  
 Ser Glu Phe Cys Asp Cys Arg Pro Val Ala Gly Ala Pro Cys Tyr Leu  
 965 970 975  
 Tyr Phe Ile Gln Leu Thr Leu Gln Cys Pro Ile Pro Glu Glu Gln Asn  
 980 985 990  
 Thr Arg Gly Arg Lys Ile Tyr Pro Pro Glu Asp Ala Gln Gln Gly Phe  
 995 1000 1005  
 Gly Ile Leu Thr Thr Lys Arg Ile Pro Lys Leu Ser Ala Phe Ser  
 1010 1015 1020  
 Ile Phe Thr Arg Ser Gly Glu Val Lys Val Ser Leu Glu Leu Ala  
 1025 1030 1035  
 Lys Glu Arg Val Ile Leu Thr Ser Glu Gln Ile Val Cys Ile Asn  
 1040 1045 1050  
 Gly Phe Leu Asn Tyr Thr Phe Thr Asn Val Leu Arg Leu Gln Lys  
 1055 1060 1065  
 Phe Leu Met Leu Phe Asp Pro Asp Ser Thr Glu Asn Cys Val Phe  
 1070 1075 1080  
 Ile Val Pro Thr Val Lys Ala Pro Ala Gly Gly Lys His Ile Asp  
 1085 1090 1095



GNCA-P03-007SequenceListing.txt

|      |     |     |     |     |     |      |     |     |     |     |      |     |     |     |
|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|
| Trp  | Gln | Phe | Leu | Glu | Leu | Ile  | Gln | Ala | Asn | Gly | Asn  | Thr | Met | Pro |
| 1100 |     |     |     |     |     | 1105 |     |     |     |     | 1110 |     |     |     |
| Arg  | Ala | Val | Pro | Asp | Glu | Glu  | Arg | Gln | Ala | Gln | Pro  | Phe | Asp | Pro |
| 1115 |     |     |     |     |     | 1120 |     |     |     |     | 1125 |     |     |     |
| Gln  | Arg | Phe | Gln | Asp | Ala | Val  | Val | Met | Pro | Trp | Tyr  | Arg | Asn | Gln |
| 1130 |     |     |     |     |     | 1135 |     |     |     |     | 1140 |     |     |     |
| Asp  | Gln | Pro | Gln | Tyr | Phe | Tyr  | Val | Ala | Glu | Ile | Cys  | Pro | His | Leu |
| 1145 |     |     |     |     |     | 1150 |     |     |     |     | 1155 |     |     |     |
| Ser  | Pro | Leu | Ser | Cys | Phe | Pro  | Gly | Asp | Asn | Tyr | Arg  | Thr | Phe | Lys |
| 1160 |     |     |     |     |     | 1165 |     |     |     |     | 1170 |     |     |     |
| His  | Tyr | Tyr | Leu | Val | Lys | Tyr  | Gly | Leu | Thr | Ile | Gln  | Asn | Thr | Ser |
| 1175 |     |     |     |     |     | 1180 |     |     |     |     | 1185 |     |     |     |
| Gln  | Pro | Leu | Leu | Asp | Val | Asp  | His | Thr | Ser | Ala | Arg  | Leu | Asn | Phe |
| 1190 |     |     |     |     |     | 1195 |     |     |     |     | 1200 |     |     |     |
| Leu  | Thr | Pro | Arg | Tyr | Val | Asn  | Arg | Lys | Gly | Val | Ala  | Leu | Pro | Thr |
| 1205 |     |     |     |     |     | 1210 |     |     |     |     | 1215 |     |     |     |
| Ser  | Ser | Glu | Glu | Thr | Lys | Arg  | Ala | Lys | Arg | Glu | Asn  | Leu | Glu | Gln |
| 1220 |     |     |     |     |     | 1225 |     |     |     |     | 1230 |     |     |     |
| Lys  | Gln | Ile | Leu | Val | Pro | Glu  | Leu | Cys | Thr | Val | His  | Pro | Phe | Pro |
| 1235 |     |     |     |     |     | 1240 |     |     |     |     | 1245 |     |     |     |
| Ala  | Ser | Leu | Trp | Arg | Thr | Ala  | Val | Cys | Leu | Pro | Cys  | Ile | Leu | Tyr |
| 1250 |     |     |     |     |     | 1255 |     |     |     |     | 1260 |     |     |     |
| Arg  | Ile | Asn | Gly | Leu | Leu | Leu  | Ala | Asp | Asp | Ile | Arg  | Lys | Gln | Val |
| 1265 |     |     |     |     |     | 1270 |     |     |     |     | 1275 |     |     |     |
| Ser  | Ala | Asp | Leu | Gly | Leu | Gly  | Arg | Gln | Gln | Ile | Glu  | Asp | Glu | Asp |
| 1280 |     |     |     |     |     | 1285 |     |     |     |     | 1290 |     |     |     |
| Phe  | Glu | Trp | Pro | Met | Leu | Asp  | Phe | Gly | Trp | Ser | Leu  | Ser | Glu | Val |
| 1295 |     |     |     |     |     | 1300 |     |     |     |     | 1305 |     |     |     |
| Leu  | Lys | Lys | Ser | Arg | Glu | Ser  | Lys | Gln | Lys | Glu | Ser  | Leu | Lys | Asp |
| 1310 |     |     |     |     |     | 1315 |     |     |     |     | 1320 |     |     |     |
| Asp  | Thr | Ile | Asn | Gly | Lys | Asp  | Leu | Ala | Asp | Val | Glu  | Lys | Lys | Pro |
| 1325 |     |     |     |     |     | 1330 |     |     |     |     | 1335 |     |     |     |
| Thr  | Ser | Glu | Glu | Thr | Gln | Leu  | Asp | Lys | Asp | Ser | Lys  | Asp | Asp | Lys |
| 1340 |     |     |     |     |     | 1345 |     |     |     |     | 1350 |     |     |     |
| Val  | Glu | Lys | Ser | Ala | Ile | Glu  | Leu | Ile | Ile | Glu | Gly  | Glu | Glu | Lys |
| 1355 |     |     |     |     |     | 1360 |     |     |     |     | 1365 |     |     |     |
| Leu  | Gln | Glu | Ala | Asp | Asp | Phe  | Ile | Glu | Ile | Gly | Thr  | Trp | Ser | Asn |
| 1370 |     |     |     |     |     | 1375 |     |     |     |     | 1380 |     |     |     |
| Asp  | Met | Ala | Asp | Asp | Ile | Ala  | Ser | Phe | Asn | Gln | Glu  | Asp | Asp | Asp |
| 1385 |     |     |     |     |     | 1390 |     |     |     |     | 1395 |     |     |     |
| Glu  | Asp | Asp | Ala | Phe | His | Leu  | Pro | Val | Leu | Pro | Ala  | Asn | Val | Lys |
| 1400 |     |     |     |     |     | 1405 |     |     |     |     | 1410 |     |     |     |

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|     |      |     |     |     |     |      |     |     |     |     |      |     |     |     |
|-----|------|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|
| Phe | Cys  | Asp | Gln | Gln | Thr | Arg  | Tyr | Gly | Ser | Pro | Thr  | Phe | Trp | Asp |
|     | 1415 |     |     |     |     | 1420 |     |     |     |     | 1425 |     |     |     |
| Val | Ser  | Asn | Gly | Glu | Ser | Gly  | Phe | Lys | Gly | Pro | Lys  | Ser | Ser | Gln |
|     | 1430 |     |     |     |     | 1435 |     |     |     |     | 1440 |     |     |     |
| Asn | Lys  | Gln | Gly | Gly | Lys | Gly  | Lys | Ala | Lys | Gly | Pro  | Ala | Lys | Pro |
|     | 1445 |     |     |     |     | 1450 |     |     |     |     | 1455 |     |     |     |
| Thr | Phe  | Asn | Tyr | Tyr | Asp | Ser  | Asp | Asn | Ser | Leu | Gly  | Ser | Ser | Tyr |
|     | 1460 |     |     |     |     | 1465 |     |     |     |     | 1470 |     |     |     |
| Asp | Asp  | Asp | Asp | Asn | Ala | Gly  | Pro | Leu | Asn | Tyr | Met  | His | His | Asn |
|     | 1475 |     |     |     |     | 1480 |     |     |     |     | 1485 |     |     |     |
| Tyr | Ser  | Ser | Asp | Asp | Asp | Asp  | Val | Ala | Asp | Asp | Ile  | Asp | Ala | Gly |
|     | 1490 |     |     |     |     | 1495 |     |     |     |     | 1500 |     |     |     |
| Arg | Ile  | Ala | Phe | Thr | Ser | Lys  | Asn | Glu | Ala | Glu | Thr  | Ile | Glu | Thr |
|     | 1505 |     |     |     |     | 1510 |     |     |     |     | 1515 |     |     |     |
| Ala | Gln  | Glu | Val | Glu | Lys | Arg  | Gln | Lys | Gln | Leu | Ser  | Ile | Ile | Gln |
|     | 1520 |     |     |     |     | 1525 |     |     |     |     | 1530 |     |     |     |
| Ala | Thr  | Asn | Ala | Asn | Glu | Arg  | Gln | Tyr | Gln | Gln | Thr  | Lys | Asn | Leu |
|     | 1535 |     |     |     |     | 1540 |     |     |     |     | 1545 |     |     |     |
| Leu | Ile  | Gly | Phe | Asn | Phe | Lys  | His | Glu | Asp | Gln | Lys  | Glu | Pro | Ala |
|     | 1550 |     |     |     |     | 1555 |     |     |     |     | 1560 |     |     |     |
| Thr | Ile  | Arg | Tyr | Glu | Glu | Ser  | Ile | Ala | Lys | Leu | Lys  | Thr | Glu | Ile |
|     | 1565 |     |     |     |     | 1570 |     |     |     |     | 1575 |     |     |     |
| Glu | Ser  | Gly | Gly | Met | Leu | Val  | Pro | His | Asp | Gln | Gln  | Leu | Val | Leu |
|     | 1580 |     |     |     |     | 1585 |     |     |     |     | 1590 |     |     |     |
| Lys | Arg  | Ser | Asp | Ala | Ala | Glu  | Ala | Gln | Val | Ala | Lys  | Val | Ser | Met |
|     | 1595 |     |     |     |     | 1600 |     |     |     |     | 1605 |     |     |     |
| Met | Glu  | Leu | Leu | Lys | Gln | Leu  | Leu | Pro | Tyr | Val | Asn  | Glu | Asp | Val |
|     | 1610 |     |     |     |     | 1615 |     |     |     |     | 1620 |     |     |     |
| Leu | Ala  | Lys | Lys | Leu | Gly | Asp  | Arg | Arg | Glu | Leu | Leu  | Leu | Ser | Asp |
|     | 1625 |     |     |     |     | 1630 |     |     |     |     | 1635 |     |     |     |
| Leu | Val  | Glu | Leu | Asn | Ala | Asp  | Trp | Val | Ala | Arg | His  | Glu | Gln | Glu |
|     | 1640 |     |     |     |     | 1645 |     |     |     |     | 1650 |     |     |     |
| Thr | Tyr  | Asn | Val | Met | Gly | Cys  | Gly | Asp | Ser | Phe | Asp  | Asn | Tyr | Asn |
|     | 1655 |     |     |     |     | 1660 |     |     |     |     | 1665 |     |     |     |
| Asp | His  | His | Arg | Leu | Asn | Leu  | Asp | Glu | Lys | Gln | Leu  | Lys | Leu | Gln |
|     | 1670 |     |     |     |     | 1675 |     |     |     |     | 1680 |     |     |     |
| Tyr | Glu  | Arg | Ile | Glu | Ile | Glu  | Pro | Pro | Thr | Ser | Thr  | Lys | Ala | Ile |
|     | 1685 |     |     |     |     | 1690 |     |     |     |     | 1695 |     |     |     |
| Thr | Ser  | Ala | Ile | Leu | Pro | Ala  | Gly | Phe | Ser | Phe | Asp  | Arg | Gln | Pro |
|     | 1700 |     |     |     |     | 1705 |     |     |     |     | 1710 |     |     |     |
| Asp | Leu  | Val | Gly | His | Pro | Gly  | Pro | Ser | Pro | Ser | Ile  | Ile | Leu | Gln |
|     | 1715 |     |     |     |     | 1720 |     |     |     |     | 1725 |     |     |     |

GNCA-P03-007SequenceListing.txt

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|------|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|------|-----|-----|-----|
| Ala  | Leu | Thr | Met | Ser | Asn | Ala  | Asn | Asp | Gly | Ile | Asn  | Leu | Glu | Arg |
| 1730 |     |     |     |     |     | 1735 |     |     |     |     | 1740 |     |     |     |
| Leu  | Glu | Thr | Ile | Gly | Asp | Ser  | Phe | Leu | Lys | Tyr | Ala  | Ile | Thr | Thr |
| 1745 |     |     |     |     |     | 1750 |     |     |     |     | 1755 |     |     |     |
| Tyr  | Leu | Tyr | Ile | Thr | Tyr | Glu  | Asn | Val | His | Glu | Gly  | Lys | Leu | Ser |
| 1760 |     |     |     |     |     | 1765 |     |     |     |     | 1770 |     |     |     |
| His  | Leu | Arg | Ser | Lys | Gln | Val  | Ala | Asn | Leu | Asn | Leu  | Tyr | Arg | Leu |
| 1775 |     |     |     |     |     | 1780 |     |     |     |     | 1785 |     |     |     |
| Gly  | Arg | Arg | Lys | Arg | Leu | Gly  | Glu | Tyr | Met | Ile | Ala  | Thr | Lys | Phe |
| 1790 |     |     |     |     |     | 1795 |     |     |     |     | 1800 |     |     |     |
| Glu  | Pro | His | Asp | Asn | Trp | Leu  | Pro | Pro | Cys | Tyr | Tyr  | Val | Pro | Lys |
| 1805 |     |     |     |     |     | 1810 |     |     |     |     | 1815 |     |     |     |
| Glu  | Leu | Glu | Lys | Ala | Leu | Ile  | Glu | Ala | Lys | Ile | Pro  | Thr | His | His |
| 1820 |     |     |     |     |     | 1825 |     |     |     |     | 1830 |     |     |     |
| Trp  | Lys | Leu | Ala | Asp | Leu | Leu  | Asp | Ile | Lys | Asn | Leu  | Ser | Ser | Val |
| 1835 |     |     |     |     |     | 1840 |     |     |     |     | 1845 |     |     |     |
| Gln  | Ile | Cys | Glu | Met | Val | Arg  | Glu | Lys | Ala | Asp | Ala  | Leu | Gly | Leu |
| 1850 |     |     |     |     |     | 1855 |     |     |     |     | 1860 |     |     |     |
| Glu  | Gln | Asn | Gly | Gly | Ala | Gln  | Asn | Gly | Gln | Leu | Asp  | Asp | Ser | Asn |
| 1865 |     |     |     |     |     | 1870 |     |     |     |     | 1875 |     |     |     |
| Asp  | Ser | Cys | Asn | Asp | Phe | Ser  | Cys | Phe | Ile | Pro | Tyr  | Asn | Leu | Val |
| 1880 |     |     |     |     |     | 1885 |     |     |     |     | 1890 |     |     |     |
| Ser  | Gln | His | Ser | Ile | Pro | Asp  | Lys | Ser | Ile | Ala | Asp  | Cys | Val | Glu |
| 1895 |     |     |     |     |     | 1900 |     |     |     |     | 1905 |     |     |     |
| Ala  | Leu | Ile | Gly | Ala | Tyr | Leu  | Ile | Glu | Cys | Gly | Pro  | Arg | Gly | Ala |
| 1910 |     |     |     |     |     | 1915 |     |     |     |     | 1920 |     |     |     |
| Leu  | Leu | Phe | Met | Ala | Trp | Leu  | Gly | Val | Arg | Val | Leu  | Pro | Ile | Thr |
| 1925 |     |     |     |     |     | 1930 |     |     |     |     | 1935 |     |     |     |
| Arg  | Gln | Leu | Asp | Gly | Gly | Asn  | Gln | Glu | Gln | Arg | Ile  | Pro | Gly | Ser |
| 1940 |     |     |     |     |     | 1945 |     |     |     |     | 1950 |     |     |     |
| Thr  | Lys | Pro | Asn | Ala | Glu | Asn  | Val | Val | Thr | Val | Tyr  | Gly | Ala | Trp |
| 1955 |     |     |     |     |     | 1960 |     |     |     |     | 1965 |     |     |     |
| Pro  | Thr | Pro | Arg | Ser | Pro | Leu  | Leu | His | Phe | Ala | Pro  | Asn | Ala | Thr |
| 1970 |     |     |     |     |     | 1975 |     |     |     |     | 1980 |     |     |     |
| Glu  | Glu | Leu | Asp | Gln | Leu | Leu  | Ser | Gly | Phe | Glu | Glu  | Phe | Glu | Glu |
| 1985 |     |     |     |     |     | 1990 |     |     |     |     | 1995 |     |     |     |
| Ser  | Leu | Gly | Tyr | Lys | Phe | Arg  | Asp | Arg | Ser | Tyr | Leu  | Leu | Gln | Ala |
| 2000 |     |     |     |     |     | 2005 |     |     |     |     | 2010 |     |     |     |
| Met  | Thr | His | Ala | Ser | Tyr | Thr  | Pro | Asn | Arg | Leu | Thr  | Asp | Cys | Tyr |
| 2015 |     |     |     |     |     | 2020 |     |     |     |     | 2025 |     |     |     |
| Gln  | Arg | Leu | Glu | Phe | Leu | Gly  | Asp | Ala | Val | Leu | Asp  | Tyr | Leu | Ile |
| 2030 |     |     |     |     |     | 2035 |     |     |     |     | 2040 |     |     |     |

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Thr Arg His Leu Tyr Glu Asp Pro Arg Gln His Ser Pro Gly Ala  
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 Leu Thr Asp Leu Arg Ser Ala Leu Val Asn Asn Thr Ile Phe Ala  
 2060 2065 2070  
 Ser Leu Ala Val Arg His Gly Phe His Lys Phe Phe Arg His Leu  
 2075 2080 2085  
 Ser Pro Gly Leu Asn Asp Val Ile Asp Arg Phe Val Arg Ile Gln  
 2090 2095 2100  
 Gln Glu Asn Gly His Cys Ile Ser Glu Glu Tyr Tyr Leu Leu Ser  
 2105 2110 2115  
 Glu Glu Glu Cys Asp Asp Ala Glu Asp Val Glu Val Pro Lys Ala  
 2120 2125 2130  
 Leu Gly Asp Val Phe Glu Ser Ile Ala Gly Ala Ile Phe Leu Asp  
 2135 2140 2145  
 Ser Asn Met Ser Leu Asp Val Val Trp His Val Tyr Ser Asn Met  
 2150 2155 2160  
 Met Ser Pro Glu Ile Glu Gln Phe Ser Asn Ser Val Pro Lys Ser  
 2165 2170 2175  
 Pro Ile Arg Glu Leu Leu Glu Leu Glu Pro Glu Thr Ala Lys Phe  
 2180 2185 2190  
 Gly Lys Pro Glu Lys Leu Ala Asp Gly Arg Arg Val Arg Val Thr  
 2195 2200 2205  
 Val Asp Val Phe Cys Lys Gly Thr Phe Arg Gly Ile Gly Arg Asn  
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 Tyr Arg Ile Ala Lys Cys Thr Ala Ala Lys Cys Ala Leu Arg Gln  
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 2240 2245

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 Met Gly Lys Lys Asp Lys Asn Lys Lys Gly Gly Gln Asp Ser Ala Ala  
 1 5 10 15  
 Ala Pro Gln Pro Gln Gln Gln Gln Lys Gln Gln Gln Gln Arg Gln Gln  
 20 25 30  
 Gln Pro Gln Gln Leu Gln Gln Pro Gln Gln Leu Gln Gln Pro Gln Gln  
 35 40 45  
 Leu Gln Gln Pro Gln Gln Gln Gln Gln Gln Pro His Gln Gln Gln  
 50 55 60  
 Gln Gln Ser Ser Arg Gln Gln Pro Ser Thr Ser Ser Gly Gly Ser Arg  
 65 70 75 80

## GNCA-P03-007SequenceListing.txt

Ala Ser Gly Phe Gln Gln Gly Gly Gln Gln Gln Lys Ser Gln Asp Ala  
 85 90 95  
 Glu Gly Trp Thr Ala Gln Lys Lys Gln Gly Lys Gln Gln Val Gln Gly  
 100 105 110  
 Trp Thr Lys Gln Gly Gln Gln Gly Gly His Gln Gln Gly Arg Gln Gly  
 115 120 125  
 Gln Asp Gly Gly Tyr Gln Gln Arg Pro Pro Gly Gln Gln Gln Gly Gly  
 130 135 140  
 His Gln Gln Gly Arg Gln Gly Gln Glu Gly Gly Tyr Gln Gln Arg Pro  
 145 150 155 160  
 Pro Gly Gln Gln Gln Gly Gly His Gln Gln Gly Arg Gln Gly Gln Glu  
 165 170 175  
 Gly Gly Tyr Gln Gln Arg Pro Ser Gly Gln Gln Gln Gly Gly His Gln  
 180 185 190  
 Gln Gly Arg Gln Gly Gln Glu Gly Gly Tyr Gln Gln Arg Pro Pro Gly  
 195 200 205  
 Gln Gln Gln Gly Gly His Gln Gln Gly Arg Gln Gly Gln Glu Gly Gly  
 210 215 220  
 Tyr Gln Gln Arg Pro Ser Gly Gln Gln Gln Gly Gly His Gln Gln Gly  
 225 230 235 240  
 Arg Gln Gly Gln Glu Gly Gly Tyr Gln Gln Arg Pro Ser Gly Gln Gln  
 245 250 255  
 Gln Gly Gly His Gln Gln Gly Arg Gln Gly Gln Glu Gly Gly Tyr Gln  
 260 265 270  
 Gln Arg Pro Ser Gly Gln Gln Gln Gly Gly His Gln Gln Gly Arg Gln  
 275 280 285  
 Gly Gln Glu Gly Gly Tyr Gln Gln Arg Pro Pro Gly Gln Gln Pro Asn  
 290 295 300  
 Gln Thr Gln Ser Gln Gly Gln Tyr Gln Ser Arg Gly Pro Pro Gln Gln  
 305 310 315 320  
 Gln Gln Ala Ala Pro Leu Pro Leu Pro Pro Gln Pro Ala Gly Ser Ile  
 325 330 335  
 Lys Arg Gly Thr Ile Gly Lys Pro Gly Gln Val Gly Ile Asn Tyr Leu  
 340 345 350  
 Asp Leu Asp Leu Ser Lys Met Pro Ser Val Ala Tyr His Tyr Asp Val  
 355 360 365  
 Lys Ile Met Pro Glu Arg Pro Lys Lys Phe Tyr Arg Gln Ala Phe Glu  
 370 375 380  
 Gln Phe Arg Val Asp Gln Leu Gly Gly Ala Val Leu Ala Tyr Asp Gly  
 385 390 395 400  
 Lys Ala Ser Cys Tyr Ser Val Asp Lys Leu Pro Leu Asn Ser Gln Asn  
 405 410 415

## GNCA-P03-007SequenceListing.txt

Pro Glu Val Thr Val Thr Asp Arg Asn Gly Arg Thr Leu Arg Tyr Thr  
 420 425 430  
 Ile Glu Ile Lys Glu Thr Gly Asp Ser Thr Ile Asp Leu Lys Ser Leu  
 435 440 445  
 Thr Thr Tyr Met Asn Asp Arg Ile Phe Asp Lys Pro Met Arg Ala Met  
 450 455 460  
 Gln Cys Val Glu Val Val Leu Ala Ser Pro Cys His Asn Lys Ala Ile  
 465 470 475 480  
 Arg Val Gly Arg Ser Phe Phe Lys Met Ser Asp Pro Asn Asn Arg His  
 485 490 495  
 Glu Leu Asp Asp Gly Tyr Glu Ala Leu Val Gly Leu Tyr Gln Ala Phe  
 500 505 510  
 Met Leu Gly Asp Arg Pro Phe Leu Asn Val Asp Ile Ser His Lys Ser  
 515 520 525  
 Phe Pro Ile Ser Met Pro Met Ile Glu Tyr Leu Glu Arg Phe Ser Leu  
 530 535 540  
 Lys Ala Lys Ile Asn Asn Thr Thr Asn Leu Asp Tyr Ser Arg Arg Phe  
 545 550 555 560  
 Leu Glu Pro Phe Leu Arg Gly Ile Asn Val Val Tyr Thr Pro Pro Gln  
 565 570 575  
 Ser Phe Gln Ser Ala Pro Arg Val Tyr Arg Val Asn Gly Leu Ser Arg  
 580 585 590  
 Ala Pro Ala Ser Ser Glu Thr Phe Glu His Asp Gly Lys Lys Val Thr  
 595 600 605  
 Ile Ala Ser Tyr Phe His Ser Arg Asn Tyr Pro Leu Lys Phe Pro Gln  
 610 615 620  
 Leu His Cys Leu Asn Val Gly Ser Ser Ile Lys Ser Ile Leu Leu Pro  
 625 630 635 640  
 Ile Glu Leu Cys Ser Ile Glu Glu Gly Gln Ala Leu Asn Arg Lys Asp  
 645 650 655  
 Gly Ala Thr Gln Val Ala Asn Met Ile Lys Tyr Ala Ala Thr Ser Thr  
 660 665 670  
 Asn Val Arg Lys Arg Lys Ile Met Asn Leu Leu Gln Tyr Phe Gln His  
 675 680 685  
 Asn Leu Asp Pro Thr Ile Ser Arg Phe Gly Ile Arg Ile Ala Asn Asp  
 690 695 700  
 Phe Ile Val Val Ser Thr Arg Val Leu Ser Pro Pro Gln Val Glu Tyr  
 705 710 715 720  
 His Ser Lys Arg Phe Thr Met Val Lys Asn Gly Ser Trp Arg Met Asp  
 725 730 735  
 Gly Met Lys Phe Leu Glu Pro Lys Pro Lys Ala His Lys Cys Ala Val  
 740 745 750

## GNCA-P03-007SequenceListing.txt

Leu Tyr Cys Asp Pro Arg Ser Gly Arg Lys Met Asn Tyr Thr Gln Leu  
 755 760 765  
 Asn Asp Phe Gly Asn Leu Ile Ile Ser Gln Gly Lys Ala Val Asn Ile  
 770 775 780  
 Ser Leu Asp Ser Asp Val Thr Tyr Arg Pro Phe Thr Asp Asp Glu Arg  
 785 790 795 800  
 Ser Leu Asp Thr Ile Phe Ala Asp Leu Lys Arg Ser Gln His Asp Leu  
 805 810 815  
 Ala Ile Val Ile Ile Pro Gln Phe Arg Ile Ser Tyr Asp Thr Ile Lys  
 820 825 830  
 Gln Lys Ala Glu Leu Gln His Gly Ile Leu Thr Gln Cys Ile Lys Gln  
 835 840 845  
 Phe Thr Val Glu Arg Lys Cys Asn Asn Gln Thr Ile Gly Asn Ile Leu  
 850 855 860  
 Leu Lys Ile Asn Ser Lys Leu Asn Gly Ile Asn His Lys Ile Lys Asp  
 865 870 875 880  
 Asp Pro Arg Leu Pro Met Met Lys Asn Thr Met Tyr Ile Gly Ala Asp  
 885 890 895  
 Val Thr His Pro Ser Pro Asp Gln Arg Glu Ile Pro Ser Val Val Gly  
 900 905 910  
 Val Ala Ala Ser His Asp Pro Tyr Gly Ala Ser Tyr Asn Met Gln Tyr  
 915 920 925  
 Arg Leu Gln Arg Gly Ala Leu Glu Glu Ile Glu Asp Met Phe Ser Ile  
 930 935 940  
 Thr Leu Glu His Leu Arg Val Tyr Lys Glu Tyr Arg Asn Ala Tyr Pro  
 945 950 955 960  
 Asp His Ile Ile Tyr Tyr Arg Asp Gly Val Ser Asp Gly Gln Phe Pro  
 965 970 975  
 Lys Ile Lys Asn Glu Glu Leu Arg Cys Ile Lys Gln Ala Cys Asp Lys  
 980 985 990  
 Val Gly Cys Lys Pro Lys Ile Cys Cys Val Ile Val Val Lys Arg His  
 995 1000 1005  
 His Thr Arg Phe Phe Pro Ser Gly Asp Val Thr Thr Ser Asn Lys  
 1010 1015 1020  
 Phe Asn Asn Val Asp Pro Gly Thr Val Val Asp Arg Thr Ile Val  
 1025 1030 1035  
 His Pro Asn Glu Met Gln Phe Phe Met Val Ser Gly Gln Ala Ile  
 1040 1045 1050  
 Gln Gly Thr Ala Lys Pro Thr Arg Tyr Asn Val Ile Glu Asn Thr  
 1055 1060 1065  
 Gly Asn Leu Asp Ile Asp Leu Leu Gln Gln Leu Thr Tyr Asn Leu  
 1070 1075 1080

GNCA-P03-007SequenceListing.txt

Cys His Met Phe Pro Arg Cys Asn Arg Ser Val Ser Tyr Pro Ala  
 1085 1090 1095  
 Pro Ala Tyr Leu Ala His Leu Val Ala Ala Arg Gly Arg Val Tyr  
 1100 1105 1110  
 Leu Thr Gly Thr Asn Arg Phe Leu Asp Leu Lys Lys Glu Tyr Ala  
 1115 1120 1125  
 Lys Arg Thr Ile Val Pro Glu Phe Met Lys Lys Asn Pro Met Tyr  
 1130 1135 1140  
 Phe Val  
 1145

<210> 6  
 <211> 22  
 <212> RNA  
 <213> Photinus pyralis

<400> 6  
 ucgaaguacu cagcguaagu ga 22

<210> 7  
 <211> 22  
 <212> RNA  
 <213> Photinus pyralis

<400> 7  
 uaaagcuuca ugagucgcau uc 22

<210> 8  
 <211> 83  
 <212> RNA  
 <213> Photinus pyralis

<400> 8  
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 guuaucaagg auuuuagucg auc 83

<210> 9  
 <211> 62  
 <212> RNA  
 <213> Photinus pyralis

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 caucgacuga aaucccuggu aauccguugu uaacaacgga uuaccaggga uuucagucga 60  
 ug 62

<210> 10  
 <211> 44  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> primer

<400> 10  
 taatagcact cactataggg caaggtcata gttcctgcc a gctg 44



GNCA-P03-007SequenceListing.txt

<210> 11  
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 <400> 11  
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 <210> 12  
 <211> 44  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> primer  
  
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 taatacgact cactataggg ttaagtttaa caggagaagc tgga 44  
  
 <210> 13  
 <211> 44  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> primer  
  
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 taatacgact cactataggg aaatcattgc tttcctgata atgc 44  
  
 <210> 14  
 <211> 44  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> primer  
  
 <400> 14  
 taatacgact cactataggg tagatttccg cagccccagt gttc 44  
  
 <210> 15  
 <211> 44  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> primer  
  
 <400> 15  
 taatacgact cactataggg gttgcctctc atttttcctt gatt 44  
  
 <210> 16  
 <211> 45  
 <212> DNA  
 <213> Artificial Sequence  
  
 <220>  
 <223> primer

GNCA-P03-007SequenceListing.txt

|  |    |
|--|----|
| <400> 16   |    |
| taatacgact cactataggg tatttttagac tgattacttt tataa | 45 |
| <210> 17   |    |
| <211> 44   |    |
| <212> DNA  |    |
| <213> Artificial Sequence                          |    |
| <220>  |    |
| <223> primer                                       |    |
| <400> 17   |    |
| taatacgact cactataggg tcacatgttt tggctaagac ctat   | 44 |